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DEVOTED TO TEXTILE WET-PROCESSING

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THINKS AHEAD WITH TEXTILES

AMERICAN

DYESTUFF REPORTER

Volume 49 November 28, 1960 No. 24

A SUGGESTION FOR NEW LIGHT STANDARDS AND THEIR PREPARATION

H LUTTRINGHAUS
Carbic-Hoechst Corp
Mountainside, NJ

TEXTILE laboratories throughout the USA have been confronted with the task of comparing the fastness to light of their dyeings with the official AATCC standards. When we discuss the difficulties we have all encountered, we shall, for the moment, completely disregard the criticism our testing methods have created internationally. We feel that our own domestic troubles are sufficient to look for an improvement for our American light standards. We shall therefore adhere to our present methods and only suggest simplifications which do not involve changes in our testing specifications. We all know that our light standards, being produced from blends of CI Mordant Blue 1 (CI 43830) and CI Solubilized Vat Blue 8 (CI 73801) have the drawback of showing a mottled effect when exposed to light. Furthermore, it is very expensive for our organization to prepare the present blue standards, and it is an imposition on anybody to foot the bill when one of the standards is exhausted and its preparation has become necessary. We would like to suggest, therefore, new standards which can be prepared by any reliable laboratory, or if it should be preferable, can be dyed in a simple way by any piece dye house under AATCC supervision.

CI Solubilized Vat Blue 8, the main component of our light standards, is a level-dyeing product which exhausts completely with acetic acid. To prevent premature oxidation, the dyebath contains a reducing agent, such as Rongalite. Most of the available blue acid or chrome dyes are destroyed in a dyebath containing such a reducing agent or are affected by the oxidizing method. Therefore, a mixture with a dyestuff of lesser fastness could only be accomplished by blending tops dyed separately, resulting in the abovementioned drawback of a mottled dyeing after exposure.

We have established now that Wool Fast Blue GLA (CI Acid Blue 102), which, as such, has lightfastness properties similar to CI Mordant Blue 1, not only withstands the addition of a reducing agent such as Rongalite to the dyebath but also is not impaired by the strong oxidizing bath containing a high amount of sulfuric acid and bichromate necessary to develop fully the leucoester CI Solubilized Vat Blue 8. We prefer the specific use of Wool Fast Blue GLA (General Dyestuff Co) since this product is better suited because of shade and properties than other types falling under the same *Colour Index* designation. The product levels well enough, especially if dyeing is carried out according to our method without Glauber's Salt. The dyeing method is the same for all standards and is specified below.

Among several materials tested, we selected, as the best suitable, piece goods identified as 100% worsted fabric No. 515 available from Testfabrics Inc, 55 Van Dam Street, New York 13, New York. Dyeing is carried out on this material according to the following method. The dyestuff is dissolved in hot water (do not use a steam pipe) and is added to the dyebath containing 5% ammonium sulfate and 1% Rongalite. The temperature should be 100-110°F when the material is entered. Bring to the boil and after boiling for 30 minutes add slowly 3% acetic acid 56%. Boil for one hour and wash off. Development is started cold with 2% ammonium sulfocyanide and 3% bichromate. After 15 minutes 10 g/l sulfuric acid 96% is added and the temperature is raised to 185°F and kept at 185°F for one hour. The dyeing is washed off as usual and when the bath is lukewarm 2% soda ash is added. After 15 minutes this is washed off again, which leaves the material usually at a pH of about 5. We have prepared dyeings in such proportions as to fade equally with the present standards 5, 6, 7, and 8. Anything below light standard 5 is for most of minor importance, but it would be easy enough to prepare equivalent matches below standard 5. The established proportions are given herewith and the comparative spectrophotometric readings of the exposed and unexposed part of the dyeings as listed show the close relationship between the old and new proposed standards. The determinations of small color differences were carried out according to Davidson and Hanlon (*1*). The spectrophotometric readings checked the visual selection of the proposed light standards.

Dyeings which faded equally with the present standards were selected visually and measured spectrophotometrically. We are giving herewith the suggested dyestuff combinations which are practically equivalent for each standard, visually as well as spectrophotometrically.

Proposed Standard 5
2.2% CI Solubilized Vat Blue 8
0.4% Wool Fast Blue GLA Extra
Proposed Standard 6
2.5% CI Solubilized Vat Blue 8
0.25% Wool Fast Blue GLA Extra
Proposed Standard 7
2.7% CI Solubilized Vat Blue 8
0.15% Wool Fast Blue GLA Extra
Proposed Standard 8
3% CI Solubilized Vat Blue 8

Exposures were made in the Fade-Ometer and in sunlight in Florida. Sunlight exposures were carried out comparatively until a distinct break occurred.

Standard 5 (Fade-Ometer)

Unexposed		*Exposed*	
X= 5.70	x=0.2106	X= 6.03	x=0.2150
Y= 6.05	y=0.2235	Y= 6.42	y=0.2290
Z=15.32		Z=15.59	
27.07		28.04	

△ E=5.1 (MacAdam)

Proposed Standard 5 (Fade-Ometer)
2.2% CI Solubilized Vat Blue 8
0.4% Wool Fast Blue GLA Extra

Unexposed		*Exposed*	
X= 5.11	x=0.2058	X= 5.33	x=0.2089
Y= 5.14	y=0.2070	Y= 5.50	y=0.2156
Z=14.58		Z=14.68	
24.83		25.51	

△ E=4.9 (MacAdam)

Standard 5 (Sun)

Unexposed		*Exposed*	
X= 5.53	x=0.2095	X= 6.12	x=0.2199
Y= 5.81	y=0.2202	Y= 6.45	y=0.2318
Z=15.05		Z=15.26	
26.39		27.83	

△ E=12.1 (MacAdam)

Proposed Standard 5 (Sun)

Unexposed		*Exposed*	
X= 5.81	x=0.2072	X= 6.57	x=0.2165
Y= 5.95	y=0.2122	Y= 7.02	y=0.2314
Z=16.28		Z=16.75	
28.04		30.34	

△ E=12.8 (MacAdam)

Standard 6 (Fade-Ometer)

Unexposed		*Exposed*	
X= 5.15	x=0.2098	X= 5.47	x=0.2139
Y= 5.42	y=0.2207	Y= 5.78	y=0.2260
Z=13.98		Z=14.32	
24.55		25.57	

△ E=4.8 (MacAdam)

Proposed Standard 6 (Fade-Ometer)
2.5% CI Solubilized Vat Blue 8
0.25% Wool Fast Blue GLA Extra

Unexposed		*Exposed*	
X= 6.02	x=0.2088	X= 6.15	x=0.2119
Y= 6.17	y=0.2140	Y= 6.43	y=0.2216
Z=16.64		Z=16.44	
28.83		29.02	

△ E=4.4 (MacAdam)

Standard 6 (Sun)

Unexposed		*Exposed*	
X= 5.12	x=0.2090	X= 5.72	x=0.2175
Y= 5.38	y=0.2196	Y= 6.03	y=0.2293
Z=14.00		Z=14.55	
24.50		26.30	

△ E=9.6 (MacAdam)

Proposed Standard 6 (Sun)

Unexposed		*Exposed*	
X= 5.70	x=0.2081	X= 6.18	x=0.2140
Y= 5.87	y=0.2143	Y= 6.57	y=0.2275
Z=15.82		Z=16.13	
27.39		28.88	

△ E=8.5 (MacAdam)

Standard 7 (Fade-Ometer)

Unexposed		*Exposed*	
X= 5.23	x=0.2123	X= 5.53	x=0.2151
Y= 5.53	y=0.2244	Y= 5.87	y=0.2283
Z=13.88		Z=14.31	
24.64		25.71	

△ E=3.4 (MacAdam)

Proposed Standard 7 (Fade-Ometer)
2.7% CI Solubilized Vat Blue 8
0.15% Wool Fast Blue GLA Extra

Unexposed		*Exposed*	
X= 5.85	x=0.2103	X= 6.13	x=0.2126
Y= 6.13	y=0.2203	Y= 6.53	y=0.2264
Z=15.84		Z=16.18	
27.82		28.84	

△ E=3.8 (MacAdam)

Standard 7 (Sun)

Unexposed		*Exposed*	
X= 4.90	x=0.2089	X= 5.37	x=0.2150
Y= 5.15	y=0.2195	Y= 5.67	y=0.2270
Z=13.41		Z=13.94	
23.46		24.98	

△ E=7.6 (MacAdam)

Proposed Standard 7 (Sun)

Unexposed		*Exposed*	
X= 5.67	x=0.2086	X= 6.23	x=0.2127
Y= 5.94	y=0.2185	Y= 6.68	y=0.2281
Z=15.57		Z=16.38	
27.18		29.29	

△ E=6.4 (MacAdam)

Standard 8 (Fade-Ometer)

Unexposed		*Exposed*	
X= 4.92	x=0.2103	X= 5.13	x=0.2137
Y= 5.18	y=0.2214	Y= 5.43	y=0.2262
Z=13.30		Z=13.45	
23.40		24.01	

△ E=3.9 (MacAdam)

Proposed Standard 8 (Fade-Ometer)
3% CI Solubilized Vat Blue 8

Unexposed		*Exposed*	
X= 5.79	x=0.2118	X= 5.95	x=0.2121
Y= 6.08	y=0.2224	Y= 6.32	y=0.2253
Z=15.47		Z=15.78	
27.34		28.05	

△ E=1.6 (MacAdam)

Standard 8 (Sun)

Unexposed		*Exposed*	
X= 4.87	x=0.2099	X= 5.20	x=0.2154
Y= 5.12	y=0.2207	Y= 5.46	y=0.2262
Z=13.21		Z=13.48	
23.20		24.14	

△ E=5.6 (MacAdam)

Proposed Standard 8 (Sun)

Unexposed		*Exposed*	
X= 5.83	x=0.2136	X= 5.80	x=0.2118
Y= 6.13	y=0.2245	Y= 6.15	y=0.2245
Z=15.34		Z=15.44	
27.30		27.39	

△ E=2.1 (MacAdam)

When preparing these new standards, we were not concerned in reproducing the same correct mathematical proportions of the blends. We were only eager to reproduce visually and spectrophotometrically the same results. As a matter of fact, our proposed standard 8 might be preferred because as a straight CI Solubilized Vat Blue 8 dyeing, it does not show a break in the Fade-Ometer after about 20 hours as our present standard 8 does because of the admix of CI Mordant Blue 1.

The simplicity of the preparation of our proposed new standards is obvious. We offer this improvement to the AATCC and suggest that our findings are checked and, if necessary, be corrected.

We are convinced that the acceptance of such standards would not only help the AATCC out of a dilemma when a certain standard is exhausted but would also be much more economical for our organization and its members.

ACKNOWLEDGMENTS

We wish to thank Dr Weingarten of Farbwerke Hoechst AG for the spectrophotometric evaluations.

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(1) Davidson and Hanlon, *J Opt Soc Am* 45, No. 8, 617-20 (1955).

Abstracts

The Action of Heat on Wool

Bell, J W, Clegg, D and Whewell, C S, *Dyer* 124, 98-9, July 15, 1960

Earlier investigators found that when wool was heated to 160°C for times of up to 35 hours, it became yellow, a change attributed to the formation of an internal peptide.

Treatments which reduce the ease with which wool is degraded by heat are few, but of particular interest are the observations that fabrics acidified with dilute sulfuric acid yellow less readily than untreated fabrics; also, wool treated with certain unsaturated compounds, particularly maleic anhydride, is much more resistant to degradation by heat than untreated wool.

The present authors have studied the changes taking place when wool is heated to 200°C, at which scorching takes place readily.

As the depth of color of the scorched material increases, so does the alkali and water solubility, while the cystine content falls steadily (almost to zero) and that of tyrosine only slightly. The resistance of the fibers to extension is also greatly reduced.

To obtain information on the reactions involved, wool fabrics were chemically modified by acetylation, methylation, and sulfonation (by immersion for 30 minutes in 80% sulfuric acid and by immersion for 15 seconds in conc sulfuric acid, followed in both cases by thorough rinsing in water).

Both acetylated and methylated wools when heated to 200°C became first yellow and then brown like the untreated material. On the other hand, the wool treated with sulfuric acid was found to be markedly resistant to scorching. This effect is not primarily associated with the low pH of the cloth (wool similarly treated with hydrochloric acid is less resistant). Also, if the acidified fabrics are not thoroughly washed, they contain large amounts of acid, and scorch even more than untreated wools.

Wool fabric was also impregnated with reagents that are known to lessen the thermal decomposition of cellulose. Only impregnation with aluminum sulfate or a mixture of borax and boric acid produced any marked alteration in the susceptibility to scorching. It was found, however, that wool treated with a mixture of THPC and urea reduced the yellowing.

The reactions between sulfuric acid and wool are complex and are certainly not limited to modification of amine groups. Much more work needs to be done, the authors say, before the action of heat on wool is understood.

•

Acrilan—Luxury Carpet Fiber

Anon, *Man-made Textiles* 37, 42-5, August, 1960

Functionally good fibrous floor coverings should be thermal insulating, sound-absorbing, and resistant to continued wear and soiling.

To qualify for this end-use, a fiber should also be processable on available textile equipment, dyeable to acceptable fastness in standard dyeing equipment, and capable of being finished by normal procedures.

In the past, authorities agreed that wool fulfilled these requirements better than any other fiber. Now, however, a systematic investigation of Acrilan acrylic fiber in direct comparison with wool has shown Acrilan to be at least equivalent to wool in the desired carpet qualities, according to the writer.

Identical carpet constructions were made with Acrilan, rayon, acetate, nylon and carpet wool, and were subjected to floor tests in various places, including an accelerated test in the Hall of Chemistry in Disneyland, where the carpets were walked over by 150,000 people.

At intervals during this floor test, evaluations of crushing were made by measuring the retained thickness of the carpets. These tests revealed that Acrilan has compressional resilience superior to wool as well as to the other fibers tested, the writer states.

Acrilan also is said to retain its ability to deform compressionally and to recover from this deformation better than wool and the other fibers.

The cross-section of 15.0 denier Acrilan is very nearly round and the fiber surface is smooth. These factors, together with lower moisture regain of Acrilan, contribute to soil resistance, cleanability and good spot-removal characteristics.

Acrilan in both commercial and home installation has demonstrated that it is essentially static-free when properly handled. After scouring and stock-dyeing, an application of Sapamine WL (½-1½%) is recommended as a lubricant and antistatic agent. This finish not only controls static in the finished carpet but is said to act also as an effective soil retardant.

Like every other fiber commonly used in carpeting, Acrilan is not fireproof. All commerical carpets of this fiber made to date, however, pass the U S Flammable Fabrics Act test and others as to ignition time, rates etc.

All acetate dyes will dye Acrilan, and the fiber also has excellent affinity for cationic dyes, particularly the newer types on the market. No dyeing assistant or special equipment is required.

•

Japan's Chemical Fibers

Anon, *Fibres & Plastics* 21, 261, Sept, 1960

As recently as two or three years ago the emphasis in Japanese chemical fiber production was on the cheaper fibers, principally viscose staple. Today all that is changed; the Japanese Chemical Fibers Association in the 1960 issue of their publication *Rayon and Synthetic Fibers of Japan* show that not only does Japan rank second only to the U S in quantity of fiber produced but that she makes many more high-quality fibers than formerly; there is now no kind of fiber that is important in

Britain and America that does not have its counterpart in Japan, the author states.

Cellulose fibers are mainly made from wood pulp. Viscose staple has much the largest production: 595 million lbs in 1959, of which some 60% was crimped (for blankets and carpets).

Filament viscose rayon amounted to 174 million lbs in 1959, and high-tenacity rayon to 45 million lbs. Continuous filament cuprammonium yarn is also being made in Japan.

Cellulose acetate production in 1959 was 25 million lbs. A particularly interesting product is *Alon;* it is made by acetylation in fibrous form of high-tenacity viscose rayon. This method of fibrous acetylation is something quite new and has great possibilities.

Nylon 6 has so far constituted Japan's nylon production, under the name *NRC* nylon and *Amilan.* It amounted to nearly 70 million lbs in 1959. Production of nylon 6,6 is due to start soon.

Vinylon is Japan's own synthetic fiber, the product of Japanese research and development. It has a higher moisture regain than most synthetics, and it is relatively cheap; fabric made from it is not unlike cotton fabric. Fishing equipment takes most of the filament *Vinylon,* while serges and suitings are the main products from the staple fiber. Production in 1959 amounted to about 37 million lbs.

The output of PVC fibers in 1959 was 8 million lbs. The outstanding virtue of this fiber is that it is non-flammable; it is also cheap.

Exlan and *Vonnel* are acrylic fibers, closely related to *Courtelle, Acrilan* and *Orlon.* Production in 1959 was 28 million lbs.

Tetoron is the Japanese polyester equivalent of *Dacron* and *Terylene.* About 31 million lbs were made in 1959.

The production of polypropylene fiber is also to be undertaken, it is predicted.

•

Biological Perspectives in Textile Research

Siu, R G H, *J Textile Inst 51,* P439-48, August, 1960

The author pays tribute to the Textile Institute for its many accomplishments in textile research, commencing with the inaguration of co-operative research in 1916.

Long before the birth of the Institute, there had been continual emphasis on improving the sources of the natural fibers. Much effort had gone into the selection and breeding of new varieties of animals and plants. The improvement of sheep began possibly well over 7000 years ago. Within the last 50 years, the Columbia breed of sheep has been developed within the U S and is now found in practically every state. During the same period, the fleece weights have been increased from less than seven pounds to over 8.5 lbs.

Progress in the breeding of cotton (eg, by crossing the Arizona wild cotton with Sea Island cotton) has resulted in various new hybrids of superior quality. As a result of such breeding programs, and other improvements in agricultural practices, the yield of cotton in the U S has risen from an annual figure of 176 lbs per acre in 1910 to about 470 lbs this year.

These studies were followed by attempts at conservation, namely, the preservation of raw and finished goods against biological damage.

Investigations on the microbial degradation of wool showed that fungal species which attack wool are relatively few compared with those attacking cellulosic materials, and are closely allied with those connected with human skin diseases. Protection of wool against micro-organisms has never received as much attention as has protection against insects.

The development of mothproofing agents has so far been largely empirical. However, some interesting fundamental observations have been published on the mechanism of breakdown by clothes moths and carpet beetles, which is briefly described. Several mothproofing chemicals (DDT, Mitin FF and the Eulans) are discussed.

Another line of related work which is referred to briefly is the use of chemical repellents in clothing, not for prevention of damage to the *fabric* itself, but for protection of the *man* from insects which bite.

Even more intensive has been research on the prevention of microbiological deterioration of cellulosic textiles. The direction of research followed three principal lines: meaningful test methods for mildew resistance, the fundamental aspects of cellulose decomposition by micro-organisms, and effective mildewproofing methods. There has been impressive progress in each area. Fungicides continue to be the most practical agents for mildewproofing cotton textiles. While many compounds have been tested, copper-8-quinolinolate remains the most effective.

Finally, the author discusses the progress in recent years in biological research on the actual requirements of the human user of textiles for his own comfort and functional efficiency.

Thirty-nine references to the literature are cited.

•

The Radiation-induced Graft Copolymerization of Methacrylic Acid to Nylon

Roberts, R and Thomas, J K, *J Soc Dyers Col 76,* 342-4, June, 1960

Over the past few years the literature on radiation chemistry has contained an increasing amount of work on the radiation-induced grafting of monomers to various polymers. Several methods have been used, including both wet and dry treatments.

In the present work, the effect on the electrical properties of nylon of small amounts of grafted methacrylic acid was studied. Usually amounts not exceeding 10% by weight of methacrylic acid were grafted on to nylon 6,6, and the modification of the electrical properties, as shown by the electrical resistance of the nylon, was measured.

The grafting procedure used by the authors consisted in irradiating the nylon fabric or fiber in air by gamma rays from a 120-curie Co^{60} source. In a typical experiment, a small sample of the irradiated nylon was covered with aqueous methacrylic acid solution at pH 3.7, deaerated by a vacuum pump, and kept under vacuum at a chosen temperature for a suitable length of time. The solution was then tested to determine the amount of methacrylic acid grafted to the nylon. The technique of this procedure is described in detail.

The authors explain the effect of the irradiation of the nylon on the basis that it produces an organic peroxide or hydroperoxide which decomposes thermally, producing free radicals which are able to initiate the polymerization of the methacrylic acid.

The solubility of nylon with a 10% graft of methacrylic acid was greatly decreased, in all the common solvents for nylon (eg, hot benzyl alcohol or formic acid); in fact, no solvent for the material was found.

The electrical surface resistance of the grafted nylon was one-tenth to one-fiftieth that of ungrafted nylon. Although this is a marked difference, it is not sufficient to dissipate the large electrical charges which are built up on nylon, the authors state.

Temperature has a marked effect on the rate of grafting to a nylon fiber which, eg, has been irradiated to a total dose of 0.3 megarad. At 75°C the rate is nearly three times as great as at 55°C.

Fourteen references to the literature are cited.

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American Association of Textile Chemists and Colorists
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November 28, 1960 No. 24

Metropolitan Section——

AUTOMATIC SCREEN PRINTING*

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The author cites statistics which show that 458 automatic screen printing machines are operating throughout the world, of which 277 are in Europe and only 30 in the United States. Automatic screen printing is compared with roller printing of quality prints which are not mass produced, in terms of labor costs, color costs, production, and flexibility of operation. The specific features of the Reggiani, Buser, Comerio, Stork, Thorne, Zimmer and Ichinose machines are discussed. Only the Reggiani and Buser machines have been producing on a large scale for several years in the U S. The author also makes the point that automatic screen printing machines are an integral part of most European roller printers while in the U S only some manual screen printers have converted to this automation.

INTRODUCTION

AFTER a great many years of evolution and development, automatic screen printing has become one of the most important tools in the art of textile printing throughout the world.

There are 458 automatic screen printing machines in operation all over the world (*1*). Of this total, 277 are in Europe and only 30 are in the United States. Italy and France alone operate 136 machines, and anyone who has shopped the better stores in New York knows where a considerable part of their production is sold.

Most of the European installations are attached to roller-printing plants. Practically every quality printer in Europe operates them, with some of these installations consisting of six and more machines. In the United States, it is mainly the manual screen printer who has had the forsight to convert his plant to automatic operation.

COMPARISON — SCREEN VS ROLLER PRINTING

How competitive is automatic screen printing today? I believe that many of you are familiar with the superior quality of automatic-screen prints, the brilliance and depth of the colors, the accuracy of the repeats and the versatility of designs. Screenprints possess a casualness, an easy-to-live-with quality, preferred by the discriminating buyer. It has been exceedingly gratifying to see a very definite trend toward better styling in all fields. Screen printing can help you to create the wide assortment of designs you need, with less yardage. It is sufficiently flexible to produce contemporary styling, capable to adjust itself to the job. It permits you to experiment quickly and economically and put your imagination to work. Competition, and particularly competition with imported fabrics, is more and more predicated upon quality, style and usefulness. I believe that screen printing can contribute to fill the ever-increasing demand for better products and its use will continue to grow right along with a prosperous America.

In comparison with manual operation, automatic screen printing has the advantage of greater accuracy of fit, and of course the labor cost differential, which amounts to from one half for large table-top covers to one fourth for multicolor drapes and dress goods. The color saving also is considerable; we have calculated it to be approximately 25% on 1000-yd runs.

Based on 12-color, 60 to 90″ wide equipment, one printer, one operator and one helper are needed for a one-machine operation; three printers, two operators and three helpers for a three-machine operation; and five printers, five operators, and 10 helpers for a ten-machine operation provided half of the machines are installed with right-hand and half with left-hand commands.

Production is calculated as follows:

$$Qy = \frac{Vt}{1 + Ts \times \frac{Vt}{Qc}}$$

where

Qy = actual speed in yards
Vt = theoretical speed in yards
Ts = setting time
Qc = quantity per combination.

In contrast with roller printing, the theoretical speed is a variable depending upon the printing width and the length of the repeat. My figures are based on the performance of the Reggiani machine, which prints in the filling direction, and on one-stroke printing, which is sufficient in most cases on this machine. Color-change time is assumed to be six minutes per color, or 36 minutes for a six-color print.

First, how does performance vary with repeat and fabric?

*Presented before the Metropolitan Section on Sept 16, 1960 at Kohler's Swiss Chalet, Rochelle Park, NJ.

Vt	Qc	Colors	Repeat	Width	Qy/hr	Qy/eight-hour shift
450	1000	6	24″	36″	355	2840
Two ends 600	1000	6	24	36	442	3640
450	1000	12	36	54	292	2315
675	1000	6	54	54	480	3840

Now, let's compare the performance of automatic screen printing with roller printing. Let us consider a 40″ silk or synthetic dress print with four combinations, five colors, a strike-off run of 3000 yds, and a production run of 9000 yds. Again I based the color changing time on six minutes for screen printing and 7.5 minutes per color for roller printing. The time differential of the set-up time is not large enough to influence this calculation.

Vt	Qc	Colors	Repeat	Width	Qy/hr	Time for style (hrs)
Roller 2100	750	5	16″	40″	785	3.8
Screen 600	750	5	3×16=48″	40	427	7.0
Two ends 800	750	5	3×16=48″	40	525	4.0
Roller 2100	2250	5	16	40	1350	6.65
Screen 600	2250	5	3×16=48	40	570	15.8
Two ends 800	2250	5	3×16=48	40	715	12.6

In comparing these figures, please take the following into consideration: the price obtainable for screen printing is considerably higher, labor cost per machine hour is lower, and on some machines, like the Reggiani and the Buser, strike offs don't have to be made on the machine itself. If one builds a short table with tracks and similar characteristics for the printing machine and uses one of the removable and individually motor-driven printing heads from the machine on this table, one is not only able to establish the correct micro-settings for squeegee angle and pressure, but also the correct squeegee and color consistency for the particular pattern and fabric. One can also work with the stylist in this manner without tying up valuable machine time.

I would like to bring out one more comparison, which is rather astounding. I have taken this time a 27″ repeat drapery print of six colors, both in 36″ and 54″ fabric width, and a run of five combinations of 1500 yds each. The screen change time remains the same, six minutes per color. The roller change time is somewhat higher due to the large circumference rollers and the long reversal time needed for these rollers. I have based it on 10 minutes per color.

Vt	Qc	Colors	Repeat	Width	Qy/hour	Time for style (hrs)
Roller 2400	1500	6	27″	36-54	925	8.1
Screen 675	1500	6	2×27=54″	54	530	14.1
Two ends 1200	1500	6	2×27=54″	36	812	9.2

You see from this how much the cost differential between roller and screen printing has shrunk, that of course only for quality prints which are not mass produced. How flexible these machines are you can see from the samples displayed here on the table.

FEATURES OF VARIOUS SCREEN PRINTERS

I have studied carefully the literature of most manufacturers. I have also studied four types of machines in operation and have based my report on what I have seen wherever possible.

Before going into detail, I would like to point out a few particular differences. On some machines, such as the Comerio, Stork, Thorne and Ichinose, the blanket is driven by the roller on the exit end of the machine and also braked there. Buser, Reggiani and Zimmer have adjustable idler rollers on the end of the machine and firmly grip the blanket all the length of the machine while moving and stopping it. In my opinion, and particularly on the very large size equipment now being installed in this country the latter method is the only one to obtain the great repeat accuracy which is required by our customers, particularly the one used to roller printing. The removable individually motor-driven printing head is certainly a feature to be considered on the Reggiani and Buser machines. On most others the squeegee drive is part of the machine and not individually adjustable. I have previously referred to one particular advantage of the individual drive.

Other features, such as hard or soft table, hard or soft squeegee, and printing in warp or filling direction are still disputed and up for future discussion. Which will prove best for future can tell.

All machines claim top printing our production methods only the speed. However, as on roller machines, printing speed depends on the type of work you are doing, on your quality requirement, and, of course on the capacity of your dryer.

Only two types of machines, Reggiani and Buser, have been producing on a large scale for several years in the United States. Four plants operate three Buser machines each. One plant runs four Reggiani machines at present and will have six in operation this fall, all of which are in one new building and run 24 hours a day. Some of these machines are the longest and widest built by either firm. Both makes of machines have for several years gone through an evolutionary process to adapt them to the requirements of large-scale American production. Europe runs an average of 300 meters per combination with two shifts at the most. Here, these machines have to stand up to round-the-clock operation with runs of many thousands of yards per combination. I have seen a Reggiani machine run 14 hours without stopping, and without washing of screens.

The Reggiani machine is very versatile and accurate, and prints in the filling direction. The blanket is moved by pneumatic clamps applied at a distance of two meters on both sides the full length of the machine. Repeats, with positive stops, are possible up to 130″. The printing heads are individually motor driven, are run on rollers on rails, and are easily positioned. The double oscillating squeegee can be micro set for angle, pressure and stroke, an outstanding feature of this machine.

Reggiani recently developed two special devices, one for printing on back greys, which is essential to produce quality prints on fine silk fabrics; the other, a device which makes the printing of sheer knitted fabrics such as 15-denier nylons possible. The difficulty in taking the fabric off the printing blanket without the curling of the edges and consequently marking off, has been overcome.

The latest Reggiani dryer installed in the United States has been equipped with a Hydrotherm high-temperature water system operating at 375°F to give better control and greater uniformity in drying expensive fabrics. Temperatures up to 500-600°F can be reached with this system.

Buser is also a versatile and accurate machine printing in the filling direction. The printing heads are individually motor driven and run on rails. The speed and the number of strokes are individually adjustable.

The printing blanket is moved by solid electromagnetic clamps which hold the blanket the full length of the machine on both sides. Repeats up to 154″ are possible.

There are four Stork machines operating in the United States. It is an excellent and fast machine, printing in the warp direction. However, the size of the repeat is rather limited, only 39″ up to seven colors and 24″ for 12 colors on the largest model. According to the literature, the newest models have a micro adjustment of the repeat.

One Comerio machine operates in New Jersey. The main feature is a resin-coated bronze mesh printing blanket. It prints up to 45″ repeat in filling direction, and the printing heads are individually motor driven.

Three other makes of machines will be in operation in the United States by the end of this year.

The Zimmer machine operates in warp direction. It is an ingeniously constructed machine and has no printing table. The printing takes place between an electromagnet and a roll inserted in the screen. The roll is used as a squeegee. The diameter of the roll may be selected according to the printing effect desired. The magnet is moved beneath the blanket for the length of the stroke. The blanket is moved by suction cups applied across the whole width of the blanket. The first demonstration model is now being erected in Brooklyn.

The only American machine is built by the Thorne Brown Company of Westport, Conn. Two of these machines have recently started operation in a Southern plant. The blanket is drum driven on the exit end of the machine, the stroke is in the warp direction, and the squeegees are driven by two steel cables on each side of the machine.

A demonstration model of the Ichinose machine, the first outside Japan, is in Woonsocket, RI, and is said to have just started to operate. The owner has stated that the machine is completely mechanically driven, by a rather complicated mechanism, and that he particularly likes the way the squeegees are attached to the printing heads, which are all moved simultaneously by a bar the whole length of the table. He also told me that the repeat, in contrast to all other machines, can only be set step by step, and I believe he said inch by inch. This of course would require extreme accuracy on the part of the screen maker and very strong and accurate frames.

I did not mention the Morrison machine because it is essentially a roller-type machine, and does not enter the scope of this paper. And I do not believe that the various machines surface printing individual garments or towels with pigments should be part of this discussion.

A few more words about the samples which are displayed here. Reggiani is one of the foremost printers in Italy, who developed the machine bearing his name initially for his own use, and then started to build it for others. Reggiani operates both roller and screen printing machines and has been of great technical assistance to myself and of course to all his customers by his experience in the printing of fine fabrics.

Reggiani has just sent me some samples which should be of particular interest to any roller printers in this audience. He sent samples of identical styles and color combinations printed both on roller- and automatic screen-printing machines, with the identical color formula. The color consumption was seven grams for each 10% coverage on the roller machine and 11 grams on the screen-printing machine. The depth of the colors on the samples clearly reflect these figures. I want to direct your attention to the fit of the screen prints, which are just as good or even in one case better than the roller prints.

The range of fabrics printed with and without back greys should also be of interest to you.

ACKNOWLEDGMENT

In closing, I wish to thank the editors of *Textile Industries* for their kind cooperation, the United States agents of their various machines for their helpful assistance, and the many others who made the preparation of this talk possible.

REFERENCE

(1) *Textile Industries 124*, No. 9, 117-24 (Sept, 1960).

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTES

Nov 17-18 (Sheraton-Atlantic Hotel, New York, NY); Nov 17—Council Committees and Research Committees; Nov 18 (AM)—ECR, TCR; Nov 18 (PM)—Council and Annual Meeting

Jan 18-20 (Sheraton-Atlantic Hotel, New York, NY); Jan 18-19—Council. Committees and Research Committees; Jan 19 (PM)—ECR, TCR; Jan 20 (AM)—Council

NATIONAL CONVENTIONS

Sept 27-29, 1961 (Hotel Statler, Buffalo, NY); 1962 (Atlanta Biltmore Hotel, Atlanta, Ga); 1963—Boston; 1964—New York; 1965 (Conrad Hilton Hotel, Chicago, Ill)

DELAWARE VALLEY SECTION

Dec 9 (Philadelphia, Pa)

HUDSON-MOHAWK SECTION

Jan 13 (Jack's Restaurant, Albany, NY—paper on Nonwoven Fabrics); Mar 10 (Johnstown, NY—paper on "Wash-and-Wear" Fabrics); Apr 14 (Waterford, NY—plant tour of General Electric Co's Silicone Div); May 12 (Ladies Night); June 23 (Outing—Antlers Club, Amsterdam, NY)

METROPOLITAN SECTION

Jan 20 (Hotel New Yorker, New York, NY—"AATCC Goals"—Ernest R Kaswell, Fabric Research Laboratories, Inc); Feb 17 (Hotel New Yorker, New York, NY—"New Developments in Dye Assistants"—speaker from the DuPont Co); Mar 24 (Kohler's Swiss Chalet, Rochelle Park, NJ—"Polyolefins"—speaker from AviSun Corp); April 21 (Kohler's Swiss Chalet, Rochelle Park, NJ—"Importance of Bow and Skew"—Lucille Rea, Simplicity Patterns, and John Robertson, Mt Hope Machine Co); May 19 (Kohler's Swiss Chalet, Rochelle Park, NJ—Ladies Night, "Detergents for Home and Mill"—Dr & Mrs Foster D Snell, Foster D Snell, Inc (tentative)

NIAGARA FRONTIER SECTION

Apr 7 (Joint meeting with Ontario Section, CATCC, St Catherines, Ont); May 18 (Buffalo, NY)

NORTHERN NEW ENGLAND SECTION

Dec 9 (Colonial Country Club, Lynnfield, Mass—"Present-day Economic Outlook in Textiles"—William I Kent, Kent Mfg Co); Jan 20 (Hotel 128, Dedham, Mass—Symposium on "Mechanical and Chemical Finishing of Textile Fabrics"—John J MacDonald, Lowell Technological Inst; D D Gagliardi, Gagliardi Research Corp; and Werner von Bergen, J P Stevens & Co, Inc)

PACIFIC SOUTHWEST SECTION

Dec 10 (dance)

PIEDMONT SECTION

Jan 21 (Poinsett Hotel, Greenville, SC); April 2 (Washington Duke Hotel, Durham, NC); June 9-10, 1961 (Outing—Grove Park Inn, Asheville, NC); Sept 23, 1961 (Hotel Charlotte, Charlotte, NC)

RHODE ISLAND SECTION

Dec 2 (Annual Meeting—Johnson's Hummocks)

SOUTH CENTRAL SECTION

Dec 9 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION

Dec 3 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION

Dec 2 (Rapp's Restaurant, Shelton, Conn)

1960 National Convention——

THE TEXTILE INDUSTRY LOOKS AHEAD*

IRENE BLUNT
Consultant
American Cotton Manufacturers Association

THE textile industry, indeed, looks ahead—But in what direction? Some look ahead only a footstep at a time. Others let their eyes, and ideas, range as far as the edge of the road. Still others look ahead but every once in a while, look fearsomely back over their shoulder. But fundamentally, the important majority looks ahead with vision, at the hill in the far distance, at the surrounding territory, with interest as to what is not only immediately ahead, but what is likely to be in the days and years to come.

Since the early years of man's history, the textile industry has been symbolic of developing civilization. Consider the origin of the word itself and how it has been applied to other uses comparable to that meaning. Textile means to put things together in a set form. The word "text" is the derivative, meaning the art of putting letters and words into a set form. When primitive men put into a set form the vines, grasses, fibers that succeeded the tree branches and other materials that provided man's first shelter and clothing, the textile industry was born.

Modern-day economists and sociology students not infrequently give us a feeling of inferiority over our supposed lack of advancement. We are accused of doing the same things over and over again. People deride the textile weaving machine as one that hasn't changed basically in centuries. The origin of our natural fibers is wrapped up in myth and ancient lore. We find it difficult to tell the story of textile's contribution to the welfare and advancement of civilization. It is so familiar that it is taken for granted. We are inclined to agree with our critics, rather than take pride in our accomplishments. The situation reminds one of the thinking today on the state of our nation. Some look around and bemoan our backwardness and our loss of prestige among the nations of the world. Others look around and with more objective eyes, see the overall importance with which we are regarded; that while we may have made mistakes, either because of ingenuousness or in ignorance, still, whether it be in envy or admiration, the philosophy, the pastimes, the work, the politics, the military and economic conditions of the people in the United States of America are followed closely in every country. We have accomplished so much, we live in such an aura of good will among ourselves that we take the good life for granted and are hurt and bewildered when the rest of the world is impressed by our own criticisms of politics, and other conditions to the end that those who resent our very success make capital out of our own freedom of speech.

In a smaller sense, so it is with the textile industry. Whether it is in praise or condemnation, the word textile creeps into many business, economic, social or labor discussions. If we analyze scientific literature, it is often surprising to note the extent of interest in textile materials on one phase or another. Yet we are accused of being hesitant to use modern research information. It is inferred that textiles are not "glamorous" enough to interest scientists.

In military developments, examine any list of military supplies, no matter what the purpose or branch of service, and find, if you can, any substantial class of items which does not use a textile. You who have done so much in providing new uses for textile materials through your chemical research know this better than anyone else.

When Samuel Slater arrived in New England in 1793 anxious to try out in the New World the designs for the new textile processing machinery which he treasured in his mind and memory, he gave this country the beginning of the Industrial Revolution. He provided for the first time regular employment and regular wages to people who had known previously only the seasonal work of the home handicrafter, or of the farm. He created, no doubt without realizing it, a new era of an industrial economy which is only beginning to be recognized by sociologists and economists as being more important than the agricultural economy around which we have built our lives and politics for two centuries. In Slater's original mill in Pawtucket, Rhode Island, now the Old Slater Mill Museum and well worth visiting, the first successful water-powered textile machinery was built. The first assembly line was successfully adapted in this country. At about the same time, Eli Whitney with his cotton gin and his development of the use of interchangeable parts, Jacquard in France with his revolutionary loom were establishing the fundamental equipment for the great era of automation of the 20th century. The gigantic machines of today for automobile and aeroplane manufacture, the intricate computers that have made possible the amazing scientific developments of the past two decades are but adaptations of these processes introduced first by the textile industry. From the commercialization of synthetic dyestuffs, applied primarily to the textile industry's needs, has come the tremendous strides in synthesis that I do not have to explain to an audience of chemists and colorists nor is it necessary to emphasize what those developments have meant to the world of industrial products, the relief of human suffering and a host of products that we associate with the Chemical Age.

In the field of modern-day advertising and promotion, it was the textile industry that led the way. Some of the oldest trade marks on file with the U S Patent Office are those

*Presented October 8, 1960 during the 39th National Convention at Philadelphia, Pa

of such textile people as Belding-Corticelli, with its kitten, and the Skinner Indian chief. In the middle of the 19th century, long before many of our most actively advertising industries of today were in existence, textile people appreciated the value of cooperative promotion. The Silk Association of America, one of the earliest trade associations of national scope, was organized in 1872 because a group of silk manufacturers decided, after showing their wares at the Crystal Palace Exposition in a cooperative display, it would be worth while to get together on a permanent basis to promote the excellence of American-made silks, and for mutual exchange of statistical information and a common approach to legislative problems. In the same spirit of cooperation, in the 1880s, this group started a cooperative testing organization, now known as the United States Testing Company. The purpose was the first semipublic means of mechanical testing of quality factors in textile fibers.

Yet, today, the average textile man does not consider himself a leader in such modern industrial activities as machinery development, automation, cooperative advertising and promotion, technical research. Indeed, the textile industry sometimes seems to find it difficult to recognize itself as an industry. Is a textile yarn and fabric manufacturere just an outlet for the products of the cotton farmer, the sheep rancher or the chemical fiber manufacturer? Or is he still a potent factor in the economic and social health of the country as the large user of agricultural and chemical products, the payer of wages to one of the largest single industry group of workers, wages which keep in business large numbers of retail establishments, banks, food markets and automobile manufacturers and dealers? How much of a retail department store's volume is in textile products of all kinds? Not long ago, in a conversation with a man of wide political and economic interests in the eastern part of this country, the subject of the future of the textile manufacturing industry and the effects of its "expendability" as proposed by a spokesman for international trade agreements, brought this comment.

> "I don't care anything about the problems of the textile manufacturer as such. I think a good part of his trouble is due to his own shortsightedness. My interests have been primarily with the welfare of the farmer and the help we can give the agricultural economy. But not long ago, I took a good look at the situation in my own native State and realized that about 75% of the bill for maintaining State government, including our schools, comes from industry. My thought is that we had better get our sights right. When it comes to deciding whether our Government policies are going to "expend" the industry, we had better consider what that would mean not only to the farmers of our state but to all the people who are living on that 75% . . ."

We cannot blame the politicians or Government officials entirely. The whole textile industry is notorious for its "Art of Negative Thinking". At the textile equivalent of the famous Gridiron Dinner of the National Press Club, the annual golf tournament of the Textile Distributors Institute, where yarn men, fabric manufacturers and converters are well represented, this parody was sung this year by an alleged group of representatives from Washington:

Oh, the Senate of the USA
Sent us here tonight to see,
Why you gripe all night and day
In the textile industry.

When it comes to passing textile bills,
You will find that we're not shy,
We'll be glad to add some codicils
Telling what and where to buy.

And in fact, if you insist on it
We will bring back yesterday
And we'll gladly bring back all
That you had with OPA

You have asked for laws protecting you
From the inroads of the Jap,
But you haven't told us what to do
When your own mills turn out scrap.

There is one thing you must all get straight
When you ask us what to do,
If you think that you've got troubles, wait,
'Till the government gets through.

And when you have got all you can get,
To the last darned subsidy,
We just bet you'll be complaining yet,
In the textile industry.

My apologies are extended to the authors of this lyric because of the necessary editing from the somewhat more forceful form in the original.

In spite of this "griping", the industry is spending millions of dollars in the installation and development of more efficient equipment. Basic and applied research money goes into new products, new processes for improved and lower-cost textile products. Yet, much news is made of the research laboratories of other industries of the country and the reports of such institutions as the National Science Foundation are quoted by those who cite the industry as spending too little on modern research methods. Professional consumer or service groups assert that the quality of textile products is unsatisfactory, claims of performance are exaggerated, prices are high. Congress passes punitive laws about textiles such as the compulsory fiber identification label, the flammability label, regardless of the degree of service which such information supplies as to the use satisfaction of a textile product in its finished form. Government officials make no bones about suggesting that the textile industry of this country be sacrificed on the altar of international good will. Economists and market analysts wail over the lack of statistical planning of production and markets. Financiers warn against the risk of investing in textile properties. Seldom is the word textiles used in articles on modern industrial development.

It is not to be wondered at that the simile of the industry looking ahead brings to mind a parade of people who seem to be walking bound about with ropes, without road signs, and pelted on all sides by the populace for whom they are working. And in many cases, the paraders themselves, like some of the fanatic religious orders of the Southwest, do a little flailing of themselves. Take, for example, the textile man who suggests that the industry needs to have information about stocks of goods available to prevent price pressures based on rumors—and refuses to supply information about his own stocks when a pool of such information is being formed. Or the textile man who is irate over the lack of beautifully presented facts and figures about the textile industry such as those circulated with great importance and value by the automobile industry—but who complains about submitting a report on production to the Bureau of Census because it takes too much clerical time from other jobs. Or the man who thinks what the industry needs is protection from inferior merchandise—but who refuses to go along with the setting of quality standards because a big customer asked him to reduce the price by taking out a few threads or using an inferior finish. Or the man who refuses to go to Washington to tell his own story except when he wants an exception made in his own case —or is shamed into it by more far-seeing competitors who realize the force of the first-hand witness. Or the man who does go to Washington to visit and confer with Government officials whose work involves the welfare of the textile industry—but who jumps up while that official is dis-

cussing the situation and says he has to get a plane or train. Summed up, the textile industry is classed in the category of inveterate gripers who really have nothing to complain about but who refuse to recognize their existence as an industry affecting the economic and political structure into which other industries make themselves an integral part.

Is it because the textile manufacturer is a rugged individualist? Is it because the industry lacks leadership because of that individualism? A challenging answer to this kind of talk was made recently by Henry N Wriston, president of the American Assembly at Columbia University, as reported in the *Wall Street Journal* and the *Readers Digest*. In his opinion, the calls for bold and imaginative action by politicians, the assertions that we have lost our sense of mission, by publishers, the accusations of moral lassitude among our countrymen today are all cast in collective terms of society. But leadership, he contends, comes from individuals with imagination, ability to inspire others with confidence. Such leaders come not only out of the ranks of individuals, but rugged individuals. Somewhere, Professor Wriston says, in the 1930s, rugged individualism became associated with industrial piracy, with exploitation of one's fellow men. So we denounced it. We went too far; to borrow a familiar expression, we "threw the baby out with the bath with the bath water" . . . Leadership is a word which describes a quality of individuals, not of a society. Today, our respect for individuality has been largely replaced by a passion for security and anonymity."

In the textile industry, we do have rugged individuals but they find it difficult apparently to accept the place of leadership by which we mean the ability to inspire others with confidence, to work with every means available to travel toward a common goal for the good of the whole. We have a good example of what the rugged individuals working in teams can do in some of our outstanding chemical organizations, especially in the field of textile chemical products, whether it is fiber, dyestuff, finishing material, or new treatment. The average textile product manufacturer does not seem to have the same perspective. We are told that the textile industry refuses to assume responsibility for its products and their performance. We are told that the textile manufacturer does not work with the whole structure of production and distribution, as does the automobile manufacturer. We are told that in such fields as basic research, the textile manufacturer does not have the vision and willingness to invest money in projects that do not bring some practical return in a relatively short period. We are also told that even the production and sales organizations of the industry have little real practice in working out the overall production and distribution of company products. Missing, it is alleged, is the type of coordinated program exemplified in some of the newer industries, where production men, administrative officials, technical men, research and market promotion executives, sales personnel, all have important roles in determining company policies. There are exceptions, of course. And great progress is being made in recognizing the need of such coordinated programs. But we have created a picture of the textile industry in the minds of the coming generation of potential workers and executives that will be hard to change. An example is found in the low enrollments in those unique institutions, the textile colleges. Young people entering college life hesitate to affiliate themselves with an industry where they have been told it is difficult to find open-minded employers, people who will treat new ideas with courage, boldness and willingness to invest "risk capital". At the same time that our textile executives are investing large sums of money for beautiful buildings, fine equipment and improved curricula in these institutions, they do not hesitate to say that when it comes to choosing trainees for administrative or other nontechnical jobs, they do not go to textile colleges. The undergraduate of a textile school wonders whether he will continue or change over to some other more general training because "there is no future in textiles". Yet, we want and need more than ever the skilled and trained man and woman. We want the type of people who will be able to take over the work of supplying this country with its always essential textiles. What future does the industry hold?

At this point, we can indeed look ahead with confidence. No man, woman, or child; no business or industry; no town, village, farm or city; no branch of our military can do without textiles. And the need grows, not diminishes. Old items will disappear; new ones will be introduced. Fibers will be seen in their original form, or in combination. New raw materials for our type of products may materialize. An open mind and a healthy pride in the markets we already have available to us—and a healthy respect for the need of preserving those markets regardless of what it means to existing practices, traditions, etc will enable the industry to look ahead with the confidence and with a new sense of belonging to the first rank of industrial giants.

CORRECTION

YOUR attention is called to a serious error which appeared on page 28 of the October 31, 1960 issue, in the paper "Concurrent Dyeing and Finishing of Cellulosic Fabrics" by the Piedmont Section.

In the paragraph beginning "In May, 1959 . . .", the second sentence should correctly read as follows: "Resin fixation was sufficient to produce excellent results in the Monsanto Crease Recovery Test."

It was erroneously stated that resin fixation was *insufficient* to produce excellent results in the Monsanto Crease Recovery Test.

AATCC Deceased

Member	*Section*
DELBERT F GIFFORD Sessions Gifford Co, Inc Providence, RI	RI
THEODORE E NESTLER Sears Roebuck & Co Ft Myers Beach, Fla	SE
HUGH M THORPE Portage Hosiery Mills Portage, Wis	MW

Olney Medal Address———

IMPROVED TEXTILE PROPERTIES FROM NEW CHEMICAL STRUCTURES*

ARNOLD M SOOKNE
Harris Research Laboratories
Washington 11, DC

The usefulness of fibers depends both on their physical properties, such as strength, elasticity and softening point, and their chemical properties, which affect dyeability, moisture sorption, etc. These physical and chemical properties depend in turn on the chemical composition of the fiber and the arrangement of its molecules, ie, its structure.

In recent years the fiber producers have provided the textile industry with a brilliant array of fibers with new chemical structures and improved textile properties. These new fibers have involved increased crystallinity, as in the isotactic polyolefins, improved orientation, or the use of graft polymers.

The textile chemist in his finishing operations also changes the structures of the fibers he handles, and in a sense he creates new fibers from cotton, rayon or wool by chemical modification. Some relationships between the chemical structure and useful textile properties of such chemically modified fibers will be discussed, with particular reference to "wash-wear" treatments for cellulosic fibers. New evidence is presented that for some "wash-wear" treatments the introduction of intermolecular crosslinks is largely responsible for the improved useful properties, and that a very large improvement in utilization of the crosslinking reagent should be possible.

There has been great progress in textile finishing in recent years, but there remain many opportunities for the improvement of old processes and the creation of new ones. The textile chemist and finisher is in a unique position to attempt such improvements, because he can chemically modify the final fabric or even the garment itself.

INTRODUCTION

ABOUT 30 years ago, two great scientific discoveries were made which were destined to affect all of us in the synthetic fiber and textile industries today. One of these was Staudinger's brilliant disclosure of the nature of long-chain molecules (*1*). From this sprang an understanding of the relationships between fibers, plastics and rubbers, all of which are composed of very large, complicated molecules. In the ensuing years the chemist and the physicist have expanded this concept and have studied in detail the chemical compositions of polymers and their architecture, and the relationships between the structures and properties of fibers. It must be admitted that many gaps remain in our understanding of the fine structure of even some of the old fibers like cotton and wool, but a rather clear general picture of the relationships between structure and properties has emerged for both the natural fibers and many of the more recent creations of the chemist. Indeed, the progress in his field has been remarkable, even for the fast-moving century in which we live.

At almost the same time that Staudinger was conducting his academic studies, Foulds, Marsh and Wood (*2*), working in the laboratory of Tootal Broadhurst Lee, made the second monumental discovery; they found the crease-resistant effect produced by urea and phenol formaldehydes on cellulose. This process has also received intense study, especially in recent years because of the great demand for "easy-care" cottons. In spite of this effort, it is probably fair to say that the mechanism has not been clearly established for any crease-resistant or "wash-and-wear" process, regardless of the nature of the chemical used. Thus, there is still considerable controversy concerning the roles of cross-linking, polymer formation, and secondary forces in producing either crease recovery or "wash-and-wear" properties. Marsh, one of the originators of the process, believes that crease recovery can be attributed to secondary forces and steric hindrance (*3*), while Perkerson, Reeves and Tripp (*4*), and Reid and coworkers (*5*), among others, are of the opinion that crosslinking is the principal factor in promoting crease recovery. The obscurity of the mechanisms involved in this and other textile finishing processes can be attributed to the complicated nature of treatments of this type.

An analysis of the situation 30 years after these discoveries shows that the polymer chemist and the textile chemist have much in common, and that they may be closer in technical interests today than at any time in the past. For example, there is good reason to believe that a clearer understanding of the action of finishing agents and their effects on the chemical composition and physical structure of the fiber would be of great value to the textile finisher and the industry he serves, as it could hardly fail to lead to a better and more economical operation. It is one of the purposes of this paper to point to some opportunities of this type. A second purpose is to describe some analogies between the roles of the polymer chemist and the textile finisher, and to show how common principles may operate in their work. Before this theme is developed, it would perhaps be helpful to review very briefly some relationships between the chemical structure of fibers and the useful properties of the textiles into which they are made.

RELATIONSHIPS BETWEEN CHEMICAL STRUCTURE AND USEFUL PROPERTIES OF TEXTILES

The general path that is followed in going from a polymer to an end-use textile item is outlined in Figure 1. As shown in this diagram, desirable fiber properties depend not only on a suitable chemical structure of the starting polymer, but also on the operation of fiber spinning or extrusion, which can impart improved orientation and order as well as an appropriate shape and length to the fiber. In turn, fiber properties are translated through spinning and weaving into fabric properties, and the textile finisher and dyer then applies his skills to impart desirable end-use properties. Obviously each of the steps illustrated is important to the final result, and it would be rather pointless to attempt to gen-

*Presented October 6, 1960 at the 39th National Convention in Philadelphia, Pa

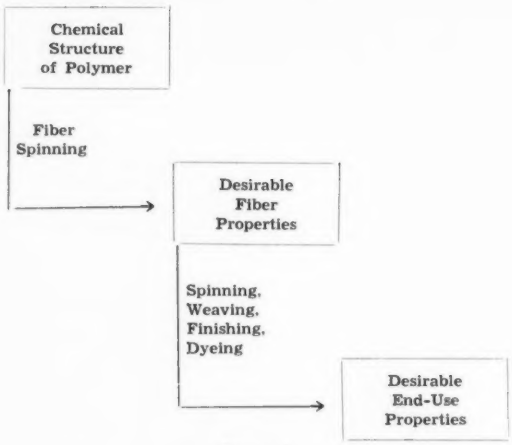


Figure 1
The path from a polymer to a textile end-use item

TABLE I
Expanded version of relationships in Figure 1

Aspects of Fiber Structure	Desirable Fiber Properties	Desirable End-Use Properties
Chemical composition	High mp	*Clothing*
Architecture	Strength	Protection
Orientation	Elasticity	Esthetic appeal
Crystallinity	Dyeability	Ease of care
Crosslinking	Moderate regain	Durability
Chain length		*Industrial Items*
Branching		Strength
		Fatigue resistance
		Durability
		Protection

eralize on their relative importance.

Table I shows an expanded version of the relationships just outlined. The factors involved in fiber structure can be broken down into chemical composition (that is, the nature of the molecules of which a fiber is composed) and fiber architecture (that is, the arrangement of these molecules). The six factors listed encompass the most important aspects of fiber structure as they are now known.

The second column of Table I lists in capsule form five of the most important fiber properties, and the third column shows the important end-use properties which the consumer seeks for clothing (upper) and for industrial textiles (lower). It can be argued that other end-use properties should be included in this table, but the properties listed are sufficiently general to include almost all of the qualities demanded by the consumer. Thus, "esthetic appeal" is intended to include both hand and appearance, and "protection" encompasses both warmth and water repellency, for example.

Now, the relationships between chemical structure and the useful properties of textiles have been described elsewhere (*6*), and particularly for the synthetic fibers Hill (*7*) and Charch and coworkers (*8, 9*) have provided clear expositions of this subject. This discussion will attempt to summarize only the most important principles very briefly. Many of these principles can be readily visualized with the help of the diagram in Figure 2, taken from Alfrey's book on "Mechanical Behavior of High Polymers" (*10*). As shown in this diagram, the long molecules of which a fiber consists can exist in a completely random configuration (a), they can crystallize into aggregates of higher order surrounded by disordered material (b), and these crystallites can themselves be oriented in the direction of the fiber axis (c). It is also possible to orient the molecules shown in "a" without crystallization in some polymers (eg, polystyrene or zein); this situation is uncommon in fibers and is not shown in the diagram. It is easy to visualize from this diagram how an increase in the length of the individual molecules would permit them to pass through two or more crystallites, and so impart increased strength and stability to the structure by increasing the number of "tie-points". The crystallites themselves, representing units of increased order and higher forces between the molecules, are also responsible for increasing the strength of the structure. Finally, the improved alignment of the molecules and crystallites in the oriented structure "c" should obviously improve the strength of the structure in the direction of the fiber axis as compared with the unoriented system shown in "b". The possibility of primary cross-links between molecules is not shown in this diagram. Indeed, it is most uncommon for the polymer chemist to practice cross-linking in making a raw material for fibers, because cross-linked polymers are generally infusible and insoluble, and so cannot be spun.

The very important effects of chemical composition as an aspect of fiber structure have also been discussed in detail in some of the references cited (*7, 8, 9*); suffice it to say that as the

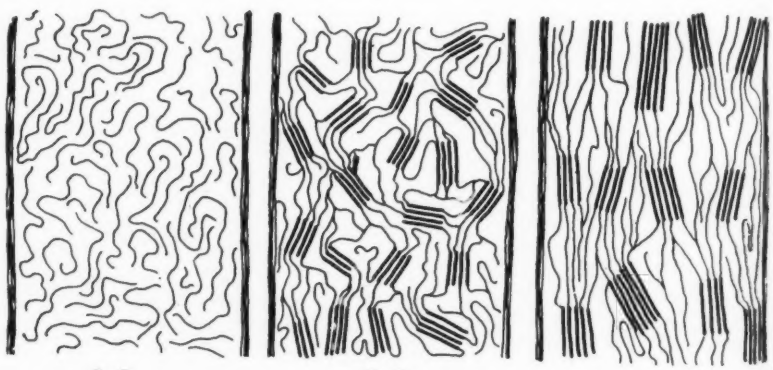
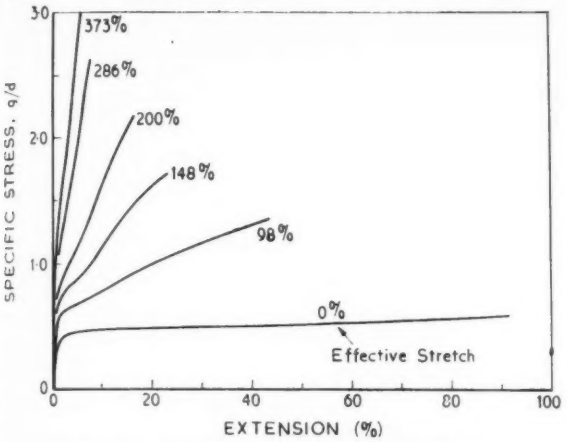
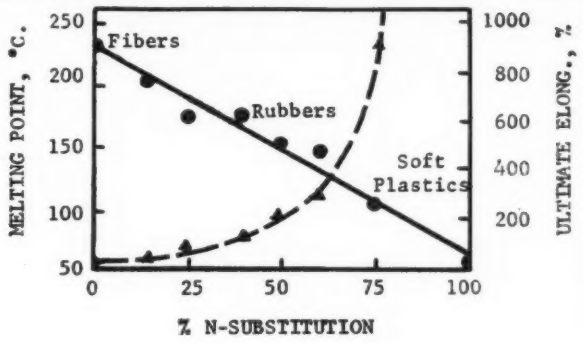


Figure 2
Schematic representation of
a) Unoriented, noncrystalline polymer
b) Unoriented, crystalline polymer
c) Oriented, crystalline polymer



Cumberbirch and Harland (1959)

Figure 3
Effect of orientation stretch on the stress-strain curves of rayon monofilaments. Tests made at 65% RH



Wittbecker, Houtz and Watkins (1948)

Figure 4
Change in melting point (solid line) and ultimate elongation (dashed line) of 6-10 nylon with increasing N-substitution

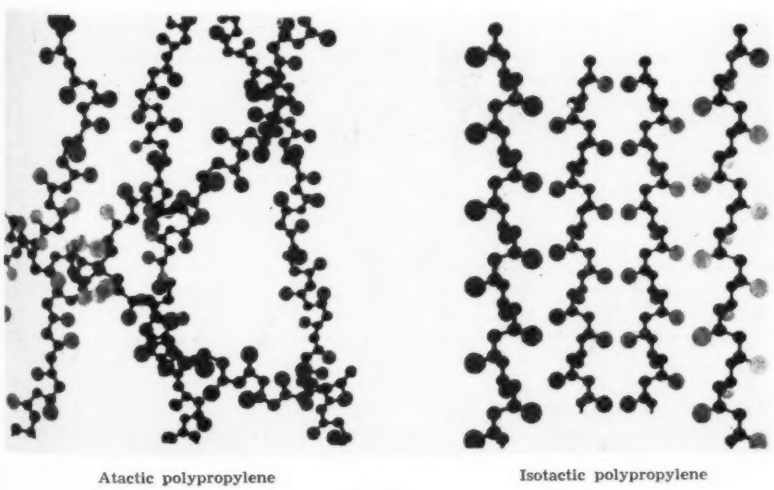
number and strength of the attractive forces in the molecule and the inherent stiffness of the polymer chain increase, the stiffness and melting point of the polymer and fiber increase.

More specific examples of the importance of orientation and crystallinity, two of the most important aspects of polymer architecture, are illustrated immediately below. The very large beneficial effect of increasing orientation on the strength of regenerated cellulose monofils (and its large adverse effect on extensibility) are shown in Figure 3, taken from the work of Cumberbirch and Harland (*11*). This well-known effect is of course the basis for much of the synthetic fiber industry's efforts. Cumberbirch and Harland have also studied the interaction between molecular chain-length and orientation stretch, and have shown that the longer molecules are more readily oriented than are the short ones.

A classic demonstration of the importance of crystallinity to the useful properties of fibers is provided by Wittbecker, Houtz and Watkins (*12*) in their study of elastic nylons (Figure 4). In this work, the amide groups of 6-10 nylon were substituted to an increasing degree by bulky isobutyl groups (which reduce the hydrogen bonding between molecules) and the effects of this substitution on the fiber properties were studied. As shown in Figure 4, as the amide groups were substituted by the isobutyl groups the resulting product became progressively softer, changing from a fiber to a rubber to a soft plastic. The melting point was progressively reduced, and the ultimate elongation was progressively increased. Thus, it was possible to make a rubbery nylon, albeit with a relatively low melting point, by progressively reducing the crystallity of the polymer.

A more current and extremely important example of the effect of crystallinity on the useful properties of fibers is provided by the discovery of the highly ordered isotactic polymers by Natta (*13*). Figure 5 shows a schematic representation of the ordinary atactic versus the highly ordered isotactic polypropylene. In the latter, the highly regular structure results in the development of a more ordered, crystalline polymer. Fibers spun from such isotactic materials have increased melting points and higher strength, so that they are suitable for many textile uses for which the ordinary polyolefins are not suited.

Block and graft polymers, shown schematically in Figure 6, represent other recent developments in polymer structure which affect importantly the useful properties of textiles. In both these new classes of polymeric materials, macrosegments—units of moderate molecular weight—are in-



Atactic polypropylene

Isotactic polypropylene

Figure 5
Atactic vs isotactic polypropylene

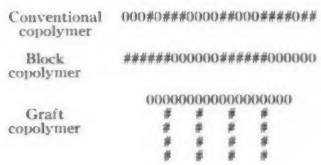


Figure 6
Schematic representation of conventional, block and graft copolymers

TABLE II
Effects of some fiber structure factors on useful properties of textiles

	Melting point	*Strength*	*Elasticity, crease recovery*	*Dyeability, regain*
Orientation	0	++	±	−
Crystallinity	+	+	±	−−
Crosslinking	++	±	++	−−
Chain length	+	+	0	0

CODE

++ Large positive effect
\+ Positive effect
0 No effect
− Negative effect
−− Large negative effect
± Positive or negative effect, depending on circumstances

troduced into or along a polymer chain to add new desirable properties without adversely affecting those already possessed by the polymer. Edgar and Hill (*14*), for example, have shown how blocks of polyethylene glycol can be used to modify the properties of polyethylene terephthalates: they were able by such modifications to produce rubber-like polymers with improved dyeing properties and enhanced regain, without greatly lowering the melting point of the starting material. Presumably this principle has been employed in the development of some of the newer man-made elastomeric fibers now appearing on the market. Similarly, Zefran has been reported to be a graft polymer, with the hydrophilic grafts imparting improved regain and dyeability, while the orderly acrylic backbone preserves the tensile properties (*15*).

Table II summarizes the effect of several of the factors just discussed on some of the useful properties of textiles. The ratings given in this table represent a personal viewpoint to some extent, particularly that representing the effect of increasing crystallinity on elasticity and crease recovery of fabrics. The "±" rating in this instance is intended to suggest that an increase in crystallinity should generally be accompanied by an increase in short-range (small deformation) elasticity, and a decrease in long-range elasticity. The ± effect of cross-linking on strength refers to the well-known increase in the strength of rayon and decrease of that of cotton as a result of typical creaseproofing treatments. Very little has been said up to this point about the effects of cross-linking, but its effect in raising the melting point is well known from classical polymer chemistry, and its positive effect on elasticity and crease recovery is experienced daily in the commercial treatment of cotton for "wash-and-wear" finishes. This brings us now to the role of the textile chemist.

THE ROLE OF THE TEXTILE CHEMIST

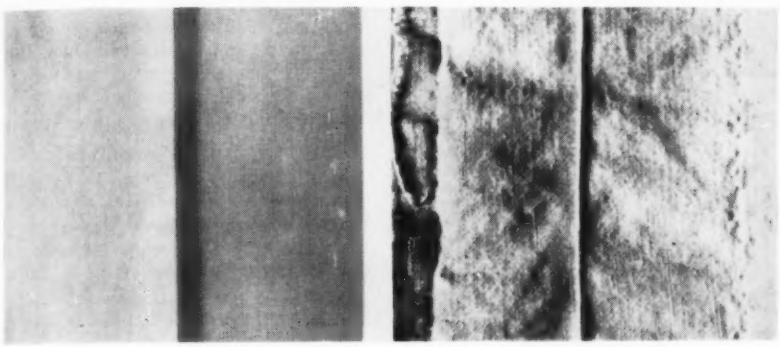
Up to this point, we have been discussing primarily matters under the control of the fiber manufacturer or the polymer chemist. The textile chemist or finisher must take his fiber as it comes, so to speak, but in a real sense he also creates new molecules and alters the chemical and physical structure of the fibers with which he works. In so doing, he can apply some of the principles which the polymer chemist has found so useful. Furthermore, the textile finisher has a unique advantage in that he performs his finishing operations on the final fabric, or even in some instances on the final garment. He can thus lock in the yarn crimp, or he can stabilize a given fabric structure by cross-linking. Unlike the polymer chemist, who must retain the solubility or fusibility of his product, the textile chemist can apply a cross-linking treatment to a fabric made from a thermoplastic fiber and benefit from the increased melting point or decreased solubility. It will now be shown how several basic concepts developed by the polymer chemist can be applied to one type of textile finishing, namely, "wash-and-wear" treatments. The basic concepts are orientation, crystallinity, and cross-linking.

A) ORIENTATION——A recent publication of Orr, Burgis and Grant (*16*) has shown that cotton fibers and yarns can be stretched during resin treatment in such a manner as to improve their molecular orientation. This procedure is analogous to that of stretch spinning of synthetic polymers, and as in stretch spinning it results in increased strength and reduced ultimate elongation. The disadvantages of applying such a stretching procedure to fabrics dur-

TABLE III
Effect of filling stretch on the properties of cotton fabrics treated with vinylcyclohexene dioxide

Fabric	*Initial filling stretch (%)*	*Crease recovery angle (degrees, W+F)*	*Breaking strength retained*[a] *Warp (%)*	*Filling (%)*	*Ultimate elongation Warp (%)*	*Filling (%)*	*Tearing strength retained Filling (%)*
Printcloth, 80 × 80							
Treated, low stretch	5	266	71	59	8.5	16.0	51
Treated, high stretch	14	245	62	74	8.8	8.8	52
Untreated	—	148	100 (61 lb)	100 (36 lb)	11.6	18.2	100
Broadcloth, 150 × 60							
Treated, low stretch	4	246	73	67	9.5	11.5	53
Treated, high stretch	10	254	74	77	10.9	6.0	63
Untreated	—	135	100 (75 lb)	100 (46 lb)	12.6	17.4	100
Broadcloth, 140 × 60							
Treated, low stretch	3	245	74	69	11.1	9.8	68
Treated, high stretch	8	246	71	98	13.7	5.2	92
Untreated	—	140	100 (79 lb)	100 (31 lb)	13.3	13.0	100

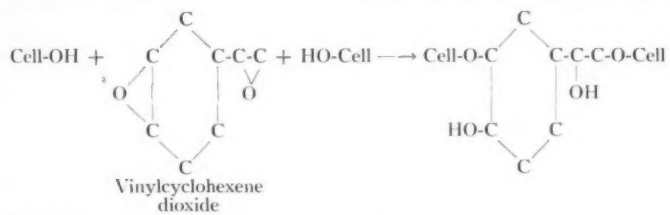
The fabrics were padded to give a dry add-on of 12% vinylcyclohexene dioxide and 0.5% zinc fluoborate catalyst. After padding, the fabrics were stretched the indicated amount in the filling direction, while the warp was held to its original size. The fabrics were then dried at 75° C for three minutes and cured for three minutes at 140° C. They were finally scoured, conditioned, and tested.
[a]Adjusted for changes in thread count.



Si-Ro-Set-creased wool — Alkali-creased cotton (Reeves and Mack)

Figure 7
Wool fabric creased by the Si-Ro-Set process (left) and cotton fabric creased with 25% NaOH (right). Both samples were laundered 10 times.

ing resin treatment are well known to the industry; indeed, the overstretching of resin-treated rayon fabrics produced disastrous results some years ago, because the resin treatment slowly washed out and the fabrics then shrank. With the advent of durable resin treatments, it is now appropriate to re-examine the possible benefits of stretch orientation in the resin treatment of the cellulosic fabrics. Vinylcyclohexene dioxide can react with cellulose to form very durable ether linkages according to the following scheme:



Vinylcyclohexene dioxide

The effects of such "resin" treatments have recently been shown to be very durable to commercial and to home laundering (*17*). Table III shows the effect of stretch during treatment on properties of three different cotton fabrics which had been treated with vinylcyclohexene dioxide. The treatment employed was identical in each case, and involved a conventional padding procedure. For each fabric a treatment was performed at the minimum and maximum practical stretches. None of the treaments contained any softening agent.

The results in Table III show that for the print cloth and both broadcloths, treatment with a high degree of stretch during drying and curing resulted in an important gain in strength retention in the direction of the stretch, the magnitude varying with the fabric structure in a manner which has not yet been completely explained. In two of the three instances, the filling tearing strength was increased, presumably because stretching in the filling direction caused the yarns to be more rod-like and smooth. The effect on the crease recovery was minimal, and in each instance the ultimate elongation of the fabric was reduced in the stretched direction. No significant shrinkage occurred after repeated laundering, indicating that the treatment was durable and set the fabric in the stretched configuration. The substantial reduction in ultimate elongation of course raises the specter of embrittlement, a difficult factor to evaluate. Service tests on shirts made from one of the stretched broadcloth fabrics showed little or no difference in serviceability between the stretched and unstretched material. These results suggest, therefore, that the textile chemist can in some instances improve the orientation of the yarns and fibers which he treats with a consequent gain in strength and without an important penalty in other properties.

B) CRYSTALLINITY —— The operation of heat-setting is an important part of the finishing of many synthetic thermoplastic fibers, and one which is conventionally performed by the textile finisher. In performing this operation, he increases the size of the crystallites or the total degree of crystallinity, and "sets" the fabric into the desired smooth configuration. Interesting analogies exist in operations which can be performed on the natural fibers, cotton and wool. Figure 7 shows samples of such fabrics which have been set into a creased configuration by operations that can be performed by the textile finisher. The wool sample (left) was set by a procedure similar to the Si-Ro-Set process (*18*), involving pressing on a Hoffman press for 15 seconds after the fabric had been dampened with a two percent solution of monoethanolamine sulfite. The creased fabric shown was then laundered and tumble dried ten times, and still retained its crease remarkably well. This recently developed setting operation involves the breaking of primary bonds so that secondary bonds can be manipulated and the fabric can be set. The process is thus analogous to the heat setting of a synthetic fabric in that it involves the breaking of interchain forces, the rearrangement of the configuration of the fibers and molecules, and the forming of new forces so as to keep the new configuration.

The product of another setting or creasing operation, described by Reeves and Mack (*19*) is shown on the right side of Figure 7. This represents a cotton fabric which has been set into a creased configuration by ironing the fabric dampened with 25% sodium hydroxide at approximately 225°C. This sample had also been laundered ten times, and again the crease was surprisingly durable. The operation pictured here is quite similar in principle to the heat setting of a synthetic fabric, since the cellulose contains no primary valence forces between chains; rather, the swelling agent has ruptured the secondary forces between the cellulose molecules, which have been reformed in the new creased configuration. Reeves and Mack have also demonstrated the possibility of performing similar setting operations on resin-treated cotton (*19*). The perfection of such setting procedures, which would be analogous to those now available on synthetic fibers, would provide the textile chemist and the garment manufacturer with a much-needed tool.

C) CROSS-LINKING——As has been indicated above, there is much disagreement among textile chemists concerning the extent of cross-linking, polymer formation, and side-chain attachment which result from

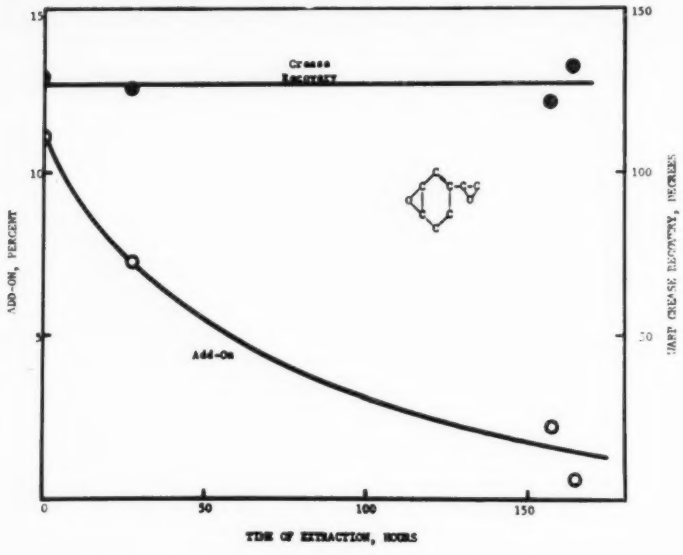


Figure 8

Effect of extraction with dimethylformamide on the crease recovery and add-on of cotton treated with vinylcyclohexene dioxide

creaseproofing and "wash-and-wear" treatments. There is also widespread disagreement concerning the importance of cross-linking in improving the functional properties of resin-treated cottons or rayons. Some rather clear evidence on this subject is provided by treatments with certain diepoxides. Thus, while the ether linkage formed by an epoxide group with the hydroxyl groups of cellulose is extraordinarily resistant to hydrolysis by acid and by alkali, it is possible to synthesize epoxy acetals which also contain acid-labile acetal linkages within the molecule. Such linkages can be rather easily broken by hydrolysis with dilute acid under conditions which are used for "stripping" ordinary nitrogenous resins. Some evidence of this type with a triepoxide has been cited earlier (*17*); new evidence with a simpler diepoxide containing acetal linkages, diglycidyl acetal, is shown in Table IV. The results in this table indicate that mild hydrolysis of vinylcyclohexene-treated cotton (30 minutes, 0.1 *N* HCl, 80°C) was without effect on its crease recovery or solubility in cupriethylene diamine. In contrast, this hydrolytic procedure almost completely reversed the effects of the treatment with diglycidal acetal. Thus, the improvement in dry crease recovery which was imparted by the treatment was almost completely removed, and the solubility of the treated fabric in cupriethylene diamine, a solvent for cellulose, was restored. Both of these results suggest the breaking of primary cross-links. It could, however, be argued that hydrolysis has also caused a loss of polymer, so that the loss of dry crease recovery cannot be unambiguously assigned to the breaking of cross-links.

More definite evidence on the role of polymer vs cross-links is provided by the new data shown in Figure 8. In these experiments, a sample of cotton fabric was treated so as to have a dry add-on of 11% of vinylcyclohexene dioxide, and its crease recovery was 130° on the scale shown. Samples of the fabric were then subjected to prolonged extraction with dimethylformamide, an excellent solvent for many polymers, at a temperature of approximately 150°C, and the remaining add-on and crease recovery were measured as a function of time. It can be seen that the treated cotton suffered a continuing and very large loss of add-on, so that after approximately 160 hours of extraction the original add-on had been reduced to less than 1%. In spite of this loss of add-on, however, the original crease recovery was retained at all stages of extraction. It is difficult to escape the conclusion that in this system most of the reagent formed polymer, and that the polymer contributed little or nothing to the dry crease recovery of the fabric. Apparently only a few cross-links were formed, but they gave rise to all of the improvement in crease recovery. The extracted samples were too small to permit the usual semiquantitative estimation of "wash-wear" rating, but it was apparent that even those extracted for 160 hours retained a high proportion of their improvement in wash-wear rating. The obvious implication of this result is that a much more economical treatment should be possible, if the proper method of application were known. This is a viewpoint which was recently advanced by O'Brien and Van Loo (*20*).

Figure 9 presents similar results which were obtained with a diepoxide of very different structure, bis-(2,3-epoxycyclopentyl) ether. Again the crease recovery was substantially independent of add-on, remaining constant with increasing time of extraction. It is, of course, impossible to generalize from these two sets of experiments to "wash-and-wear" treatments as a group. However, the suspicion is engendered that with other "wash-and-wear" treatments as well, a large fraction of the reagent may be used unproductively. In any case, it

TABLE IV

Effect of acid hydrolysis on some properties of cotton treated with diglycidyl acetal[a]

Treatment	*Crease recovery angle (degrees,W)*	*Solubility in cupriethylene diamine*
None (Control)	77	soluble
Diglycidyl acetal	121	insoluble
Diglycidyl acetal, acid hydrolyzed[b]	85	soluble
Vinylcyclohexene dioxide	120	insoluble
Vinylcyclohexene dioxide, acid hydrolyzed[b]	122	insoluble
Control, acid hydrolyzed[b]	74	soluble

Solution concentration and wet pick-up adjusted to give nominal dry add-on of 12% diglycidyl acetal and 2.0% of zinc fluoborate catalyst. Samples were dried for three minutes at 75° C. and cured for three minutes at 120° C.

[a] $H_2C\text{-}CH\text{-}CH_2\text{-}O\text{-}CH(CH_3)\text{-}O\text{-}CH_2\text{-}CH\text{-}CH_2$ (each CH bridging to an O)

[b] Hydrolyzed in 0.1*N* HCl for 30 minutes at 80°C.

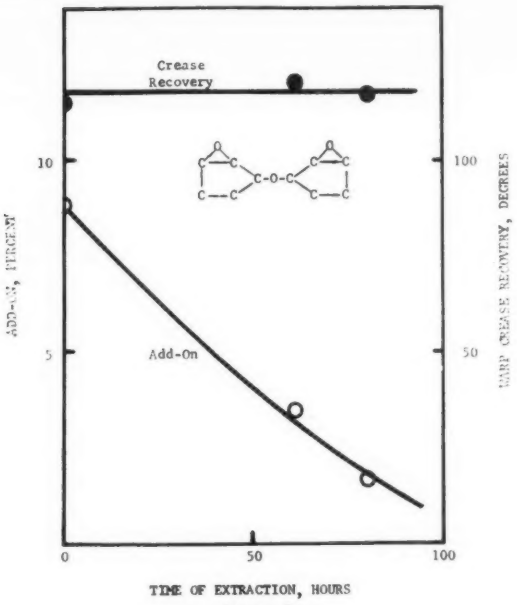


Figure 9

Effect of extraction with dimethylformamide on the crease recovery and add-on of cotton treated with bis-(2,3-epoxycyclopentyl) ether

seems obvious that more knowledge is required about the number and length of the cross-links which form in wash-and-wear treatments, as well as about their location, in order to improve the efficiency and economy of treatment.

The above discussion has been directed primarily toward "wash-and-wear" treatments for cellulosic fibers. It is certainly conceivable, however, that the textile chemist could extend his field of influence by treating some of the synthetic fibers. Such treatments are now used, but only to a very limited extent; for example, phenol-formaldehyde treatments are used to improve the heat-resistance of nylon presscloths for laundries. Durable antistatic properties, improved soil resistance and enhanced ease of cleaning would be welcomed by the consumers of synthetic fibers. The chemical modification of synthetic fibers, which to date has received very little attention, is a legitimate field of endeavor for the textile finisher.

CONCLUSION

There has been great progress in textile finishing in recent years, but there remain many opportunities for the improvement of old processes and the creation of new ones. One such opportunity has been illustrated in the area of cross-linking to produce wash-and-wear fabrics. Others must exist in other equally important areas, such as in processes for imparting permanent antistatic properties, for improving the soil resistance, or for enhancing the ease of cleaning of textiles. Such opportunities must surely exist not only in improving the older fibers but in remedying the deficiencies of some of the newer ones. The textile chemist and finisher is in a unique position to attempt such improvements, because he can chemically modify the final fabric or even the garment itself.

ACKNOWLEDGMENT

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Location: Anywhere
Age: 29; married; three dependents; excellent references

11-28, 12-12

60-35

Education: BS, chemistry, Univ of Athens; BS, textile engineering, Philadelphia Textile Inst; history of education, Univ of Pennsylvania
Position desired: Supervisory work in dyeing, textile chemistry lab, textile processing, research and development
Age: 33, married; one dependent; excellent references

11-28, 12-12

60-34

Education: Secondary school in Avellino, Italy
Position desired: Texile finisher—supervisor
Location: North or South America; anywhere
Age: 60, married, one dependent; references

11-28, 12-12

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Education: BS, textile chemistry, Lowell Technological Inst; courses at Harvard Univ
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Senior

Laurie L Whitford—Overseer of finishing, Lebanon Knitting Mill Inc, Pawtucket, RI. Sponsors: R P Farren, A Henault.

CENTRAL ATLANTIC REGION

Metropolitan Section

Senior

Samuel Blumrosen—Salesman, Atlantic Chem Corp, Passaic, NJ. Sponsors: I L Sonenshein, S Bruno.

Transfer to Senior

John L Mercer—Dyer, Waldes Kohinoor Inc, L I City, NY. Sponsors: C E Zortman, A E Raimo.

Delaware Valley Section

Senior

Alfred J Banford—Colorist, head, standardization dept, tech lab, E I duPont de Nemours & Co, Inc, Wilmington, Del. Sponsors: V D Lyon, J P Neary.

William A Fuchswanz—Sales mgr, Venango Engineering Co, Philadelphia, Pa. Sponsors: E Empting, R E Nickerson.

Richard J Palestri—Asst colorist, Toms River Chem Co, Toms River, NJ. Sponsors: J F Hughes, T P Higgins.

Associate

Nicholas B Hill—Sales trainee, dyes dept, American Cyanamid Co, Bound Brook, NJ.

Transfer to Senior

Emery I Greschler—Chemist, E I duPont de Nemours & Co, Inc, textile research lab, Wilmington, Del. Sponsors: R A Pearson, F Schulze.

SOUTHERN REGION

Piedmont Section

Associate

Ralph E Petree Jr—Sales rep, Arnold Hoffman & Co Inc, Charlotte, NC.

Joseph G Wright—Special projects chemist, Proximity Print Works, Finishing Div, Cone Mills Corp, Greensboro, NC.

Transfer to Senior

Donald G Logue—Sales rep, textile dept, Rohm & Haas Co, Charlotte, NC. Sponsors: R G Lawrence, P H DelPlaine.

A M Purut—Dyeing field tech service, American Cyanamid Co, Fibers Div, Charlotte, NC. Sponsors: J E Conway, H A Stauderman.

Southeastern Section

Associate

David E Jenkins—Salesman, Corn Products Co, Atlanta, Ga.

WESTERN REGION

Mid-West Section

Transfer to Senior

James L Mattingley—Color chemist, Best Foods, Div of Corn Products Co, Indianapolis, Ind. Sponsors: E Morrill, F Stover.

NOT AFFILIATED WITH SECTIONS

Senior

Edward D Duffin—Textile chemist, Nyanza Textile Industries Ltd, Jinja, Uganda, Brit East Africa. Sponsors: J V Moore, R C Brown.

Associate

Yasuo Hara—Chief of Nagoya Inspection House, Japan Wool Products Inspection Inst, Nagoyashi, Japan.

Transfer to Associate

Mahendra K Shah—c/o Dr K N Shah, Madan Gopal's Haweli, Raipur, Ahmedabad, India.

STUDENT CHAPTER

Philadelphia Textile Institute

Students

Arnold M Bernstein, Alexander G Burgess Jr, Robert T Cavis, Kerst S Deboo, James G Freas, Haim Goldman, Edward F Levine, Gerald C Liberace, Edward A Lisewski, John E Salidis, Randall S Sword, Lee L Tompkins, Clement Shau-chi Tung—Students, Philadelphia Textile Institute, Philadelphia, Pa. Sponsor: W H Hughes.

November 3 - November 9, 1960

NEW ENGLAND REGION

Rhode Island Section

Senior

George C Huse—Research chemist, Metro-Atlantic Inc, Centredale, RI. Sponsors: A N Henschel, E St Louis.

Terry H Trimmer—Chemist, Original Bradford Soap Works Inc, West Warwick, RI. Sponsors: A H Howland, W S Barnes.

Junior

Rene J Chaput—Res technician, Metro-Atlantic Inc, Centredale, RI. Sponsors: A N Henschel, E St Louis.

Anthony F Gallonio—Research tech, Metro-Atlantic Inc, Centredale, RI. Sponsors: A N Henschel, E St Louis.

Western New England Section

Senior

Sidney Scheinkman—Textile colorist, New London Textile Print Works, Waterford, Conn. Sponsors: J R Sharp, E H Gamble.

CENTRAL ATLANTIC REGION

Metropolitan Section

Senior

Ernest P Gecz—Dyer & officer of firm, Paul Dyeing Co, Newark, NJ. Sponsors: R E Sebra, C H A Schmitt.

Associate

Michael A Torrese—Industrial salt salesman, Morton Salt Co, New York, NY.

A B Hestwood Jr—Vice president, Turner Halsey Co, New York, NY.

Junior

Lawrence W Healy—Chemist, Central Res Lab, J P Stevens & Co Inc, Garfield, NJ. Sponsors: F F Hand, L C Kolodny.

Transfer to Senior

Guy A Baldecchi—Supt of dyeing, Nu Dye Finishing Co, Paterson, NJ. Sponsors: L S Thompson, P J Choquette.

Niagara Frontier Section

Senior

Edward Johnson—Dyer, Dominion Woolens & Wsts Ltd, Hespeler, Ont. Sponsors: R Jesel, K A Lister.

Hugh M MaGarrey—Dyehouse lab colorist, Mohawk Mills, Hamilton, Ont, Canada. Sponsors: J C Mansfield, H J Griesinger.

Delaware Valley Section

Transfer to Senior

Robert E Miller—Chemist, C H Masland & Sons, Carlisle, Pa. Sponsors: C C Fagan, H K Kerr.

SOUTHERN REGION

Piedmont Section

Senior

Griffin N Alford—Lab technician, Burlington Industries Inc, South Hill, Va. Sponsors: D M Norket, T E Powell.

Otto C Burrell—Dyer, Delta Finishing Co, Div J P Stevens & Co Inc, Cheraw, SC. Sponsors: J T Crawford Jr, H G Parrish.

Thomas M Dalrymple—Mgr, dye formula office, Delta Finishing Co, Inc, Wallace, SC. Sponsors: J T Crawford Jr, H G Parrish.

Constantin Ghionis — Principal chemist, Celanese Fibers Co, Div of Celanese Corp of America, Charlotte, NC. Sponsors: F Fortess, G C Ward.

Scott P Patterson—Head dyer, Burlington Industries, Greensboro, NC. Sponsors: J E Greer, W L Acree.

Associate

Thomas E Davis—Chief engr, Burlington Engineering Sales Co, Inc, Graham, NC.

Southeastern Section

Senior

Morris M Bryan Jr—President, The Jefferson Mills Inc, Jefferson, Ga. Sponsors: G P Paine, W G Helmus.

WESTERN REGION

Mid-West Section

Senior

Barbara J Waters—Instructor of textiles & clothing, Northern Illinois Univ, Dekalb, Ill. Sponsors: E N Cormany, E E Stout.

NOT AFFILIATED WITH A SECTION

Senior

Henkrik Goorhuis—Textile chemist, Durand & Hugeuenin SA, dyestuffs & auxiliaries, Fabrikstrasse 40, Basle, Switzerland. Sponsors: J E Duport, E C K Kraan.

STUDENT CHAPTERS

North Carolina State College

Student

Montague H Hicks Jr, Allen N James, Wesley O McGee, Charles M Nifong, Douglas E Walton, Elizabeth A Satterwhite—Students, North Carolina State College, Raleigh, NC.

Auburn University

Student

Frank W Sanders Jr—Student, Auburn University, Auburn, Ala.

"International Textile Technology—Key to Progress"

THEME SET FOR '61 CONVENTION

THE Niagara Frontier Section will be host to the 1961 National AATCC Convention, September 27-29, 1961 in Buffalo, New York. The theme has been set as "International Textile Technology—Key to Progress."

This theme, it is felt, will further stimulate interest in the truly international scope of problems common to the world-wide Textile Industry.

The Niagara Frontier Section is so situated that 50% of its membership is Canadian. The Textile Technical Federation of Canada and its constituent societies have been invited to participate in the technical program, and special arrangements have been made to provide simultaneous publication of selected papers in both the *American Dyestuff Reporter* and the *Canadian Textile Journal*.

Prospective authors are invited to submit papers or abstracts to James Rowall, 200 Wexford Ave South, Hamilton, Ontario or to Thomas R Foltz, Lockport Felt Co, Newfane, New York, cochairman, Technical Program Committee, as soon as possible so that an appropriate program may be developed.

Canadian authors are reminded that two sets of plates, graphs, etc will be required if simultaneous publication is contemplated. The "Guide for AATCC Authors and Speakers" should be followed. Copies of this manual can be obtained from National Headquarters or from the cochairman of the Technical Program Committee.

ACTIVITIES OF THE LOCAL SECTIONS

Photos by L E Rossiter, Nopco Chemical Co

Northern New England

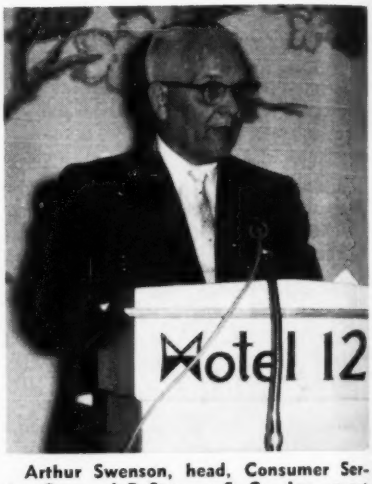
A panel discussion on "Customer Service" led by P J Fynn, director of research laboratories at J C Penney Co, Inc, New York, NY, and Arthur Swenson, head of the consumer service group of J P Stevens & Co, Inc, highlighted the October 21 meeting of the Northern New England Section which was attended by some 140 members and guests at the Hotel 128, Dedham, Mass.

Mr Fynn's discussion outlined the functions of the consumer service laboratories of the J C Penney Company and its value in appraising customer complaints and service. He further outlined the company's policy with regard to customer serviceability and described the formula used in arriving at this factor. He also pointed out the value of the laboratory in guiding the buyer in his choice of merchandise for achieving these ends. A part of Mr Fynn's talk covered the nature of the complaints which ultimately are presented to the laboratory. Some of these, although amusing in nature, indicate the value of a consumer education program conducted by the J C Penney organization.

Mr Swenson centered his discussion on the complaints at the textile mill level as they filter back through cutters and spongers. He also discussed the proposed standards for grading fabrics and this led into the panel discussion with a number of questions and suggestions from the floor.

The next meeting of the Section

Percy J Fynn, director, Research Laboratories, J C Penney Co, Inc, guest speaker



Arthur Swenson, head, Consumer Service Group, J P Stevens & Co, Inc, guest speaker

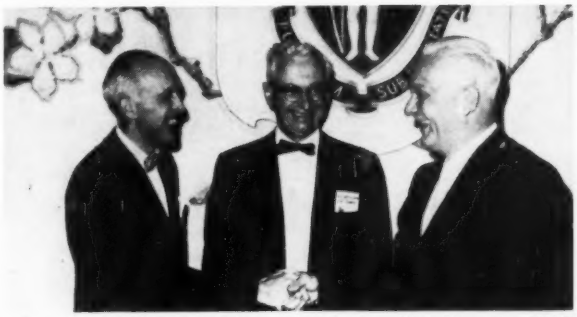
Edward J McNamara, Hamilton Chemical Co, NNE vice chairman, announces forthcoming New England Regional meeting in May, 1961

Azel W Mack (left), Dexter Chemical Corp, and Edward J McNamara, Hamilton Chemical Co, NNE vice chairman

Sectional Committeemen Bennett S Gesmer, Dyecraftsmen, Inc (left) and Herbert L Ortstein, J P Stevens & Co

L to r: Tom Walwood, QM Research and Development Command; Roland E Derby Jr, The Derby Co; and Constantin Monego, QM Research and Development Command

L to r: Daniel D Frishman, Malden Mills, NNE Sectional Committeeman; George O Linberg, Melrose Chemical Corp, past president, AATCC; Joseph S Panto, Fabric Research Labs, Inc, NNE Secretary



L to r: Robert D Robinson, Bachmann Uxbridge Co, NNE Chairman; Herbert L Ortstein, J P Stevens & Co; Arthur Swenson, J P Stevens & Co, guest speaker

L to r: Robert D Robinson, Bachmann Uxbridge Co, NNE Chairman; Percy J Fynn, J C Penney, Inc, guest speaker; Joseph S Panto, Fabric Research Labs, Inc, NNE secretary

will be its Annual Meeting on December 9 at Colonial Country Club, Lynnfield, Mass. It will be known as Management Night.

Speaker of the evening will be William Kent, president of Kent Mfg Co, Clifton Heights, Pa, and Charlottesville Woolen Mills, Charlottesville, Va. His topic will be "The Present-day Outlook in Textiles."

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Niagara Frontier

NIAGARA FRONTIER Section held its initial meeting of the 1960-61 season on Friday, Sept 23, at the Park Hotel, Niagara Falls, Ontario, with approximately 50 members, guests and wives in attendance. Speaker of the evening was Jules Labarthe, Carnegie Inst of Technology, who spoke on "10,001 Customer Complaints".

The Section held its most recent meeting Nov 4 at Canisius College, Buffalo, NY, with attendance again approximating fifty. A business session was held, with the following being elected sectional officers for 1961: *Chairman*—Anton Viditz-Ward; *Vice chairman*—Nicholas Mohoruk; *Treasurer*—J Hihill; *Secretary*—Daniel E Boland. J E Loughlin was again named to represent the Section as a national councilor.

Joseph S Panto, Fabric Research Laboratories, Inc, served as guest speaker. In his talk, entitled "How Testing Helps in a Converting Plant", he covered several subjects, including dyeability methods, agents and dyestuffs, and determining the efficiency of scouring.

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Hudson-Mohawk

HUDSON-MOHAWK Section held its first meeting of the 1960-61 season on Friday, Oct 14. Approximately 75 members and guests participated in a plant tour and dinner sponsored by Albany Felt Co, Albany, NY.

Following dinner in the plant cafeteria, the group retired to the conference room for a panel discussion of the tour. Achilles Mafilios, H-M vice chairman, introduced Albany Felt Co officials, who discussed various phases of the manufacturing operations witnessed by H-M members and guests.

H F Hedburg, vice president of research and development, discussed the history of Albany Felt Co from is beginnings up to the present.

Carl Gordan, chief chemist, spoke on the controls needed to assure fine qualities in the manufacturing of papermakers felt. He also discussed the different chemical treatments necessary to tailor felt for a particular end use.

John Sullivan, superintendent of spinning and weaving, discussed the manufacturing techniques necessary in the selection of wools, blending of wools and synthetics, yarn making, weaving, burling and joining for a fine-quality papermakers felt.

Robert Kelleher discussed the new developments the company is engaged in for the future progress of felts. He also discussed the many other products manufactured by the company, including polishing cloths, press cloths, baseball yarn, tennis felts, baseball uniforms, and printing cloths.

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Western New England

WESTERN NEW ENGLAND Section met October 21 for its Annual Meeting at Rapp's Restaurant, Shelton, Conn, with Chairman Albert H Rant presiding.

The following officers were elected for 1961: *Chairman*—Albert H Rant; *Vice Chairman*—Timothy J Horan; *Secretary*—W H Espelin; *Treasurer*—Burton C Winkler; *Councilors*—Andrew W Goodwin, Thomas J Gillick Jr; *Sectional Committee*—Alexander H DeMarco, Joseph J Black, Arthur Bibeau Jr, Gregory J Pelliccione.

In other business, Chairman Rant announced that a New England Regional meeting was being planned for May 5-6 at the Jug End Barn, Lenox, Mass. The Section approved the time and place.

In announcing that the Western New England Section had been awarded $500 to provide for a textile education scholarship as a result of its having shown the greatest percentage increase in individual membership over the past year, Chairman Rant declared that a committee would be appointed at an early date to administer the fund.

Several changes in the Section's Bylaws were approved unanimously.

Attendance was 22.

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OF THE SECOND EDITION

COLOUR INDEX

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The Society of Dyers and Colourists
19 Piccadilly, Bradford, Yorks, England

NOVEMBER NATURAL
1960

Inter Alia—Inter Nos

P J WOOD

WHO WILL FIX THE GADGETS?

George Odiorne of the University of Michigan's Bureau of Industrial Relations asks this pertinent question, as reported by "The Insider's Newsletter".

He feels that social snobbery and union work rules are the chief causes of the shortages of skilled workers in America.

Able young people, who would do better and be happier working with their hands, go to college because their parents feel that knowledge of machines and the mechanical arts is not equal in prestige (there's that word again) to a knowledge of history or social science. "Unions", says Odiorne, "are partly to blame for the shortage of skilled workers by reducing the difference in their pay and that of unskilled workers. In 1939, for example, in one industry, machinists were paid 95c an hour and machine operators 45c; now it is $2.95 and $2.45; the difference is so slight that unskilled workers are no longer motivated to become skilled".

"We can foresee the possibility", he continues, "that some day our entire gadget-enslaved economy will grind to a halt for lack of people who understand the inside of gadgets which run us".

THE LAST OF THE MOHICANS

For 75 years, Johann Krasburger had worked at his hand loom in a little village in the southeast corner of the Bavarian forest -- weaving coarse linen cloth. He was now 90 years old and still working steadily at his job every day in the week, except on Sunday; John worked, as it says in the German account of this faithful man's life -- from 5 o'clock early until 20 o'clock evenings at the clattering hand loom.

Time was when every Bavarian Hausfrau would feel that her household was far from complete if it were not liberally supplied with the hand-woven linen bedsheets, counterpanes, tablecloths and towels made by "Vater Kasburger" and his skilled fellow workers on the 5000 hand looms of Wegscheid, Untergriesbach and vicinity, looms which brought prosperity to the little village nestling among the pine trees of the Bavarian Forest.

On the occasion of the double celebration of Johann Kasburger's ninetieth birthday and his 75th year of working at the hand loom, a crowd of well-wishers really made an affair of it. In cooperation with the authorities of the village, they have arranged to open offices in several large cities where the village-woven products of the remaining 49 hand weavers will be sold, new outlets created so that the remaining years of Johann's life bid fair to make the monetary return for his labor a decided improvement on the 20 pfennig per hour he earned throughout those 75 years.

"O good old man, how well in thee appears
The constant service of an antique age
When service sweat for duty, not for meed.
Thou art not for the fashion of these times,
When none will sweat save for promotion,
And having that, they choke their service up
E'en with the having." -- Shakespeare

GUIDANCE

In a recent number of the New York Times Magazine, there appeared a very wholesome piece of writing by Edward Linzer. The article was primarily addressed to those who have as part of their duties the bringing up and guidance of children. It is based, in the main, on the principle enunciated in that old proverb "Example is better than precept".

Those of us who have no such responsibilities could do worse than take this stirring essay on conduct as part of our required reading, for right now.

Here is a sample of this inspired script: "Certainly it is true that our society puts great value on success and the material benefits that go with it. In the eyes of too many adolescents, material success represents the only goal in life, to be attained at any cost. To counteract this, parents must attack the problem directly. They must face the ethics of their community and their own conduct in regard to them. To rationalize one's own failings is no answer. To deny the temptation to say "The government can afford it" or "After all it's a wealthy chain-store" is the first step toward facing individual responsibility. Honesty and human decency must be constantly reaffirmed if we are to teach our children the better way to live". The name of the article is "Giving Them Standards to Live By" in the Sept 11 number of the New York Times Magazine. Get it and read all of it.

LIFE BEGINS AT 40

At least, that is what Walter Pitkin said in his celebrated book.

But for quite a while it did look as if many manufacturers thought it was just about to end at that age. Advertisements were frequently seen stating that applicants for any given vacancy must be "not over 40".

But conditions in this respect are changing, says Southern Textile News, and proceeds to write a right good editorial on this subject, based, in part, on the several spot surveys made by the National Association of Manufacturers. The News epitomizes the whole matter under the following heads:

"STABILITY: Older employees have a lower quit rate. Some employers have solved high turnover problems by turning to more mature workers.

ATTENDANCE: People over 50 are absent from work less than other groups.

PERFORMANCE: Patience and thoroughness are common characteristics of mature workers.

EXPERIENCE: The years behind the older worker are a part of his equipment.

SAFETY: Older workers are more careful and have the best safety records.

JUDGMENT: Age increases wisdom, and younger workers often are informally supervised "by responsible older employees working beside them".

ATTITUDE: Older workers are more "possessive" about their jobs, value them more, and are less likely to be distracted."

A recent Bureau of Labor Statistics Report says "Older workers output not only rivals that of younger people in quantity, but also in quality, and they have a steadier production rate. Workers 65 and over generally average as high as any other group".

One of the most industrious and efficient gardeners we ever had in the mill finally retired voluntarily at the good old age of 85-6. He kept the extensive lawn in perfect order, digging out each and every weed he came across; planted the flower beds in spring, after the bulbs were through blooming, trotted around the mill, after lunch, gathering up the fragments of sandwiches to feed to the ducks and geese on the mill pond and kept the beds free of weeds. Not content with this, he placed a row of large boulders along the sides of the driveways and whitewashed them so that trucks would not overrun the borders at night. His motto was "Tijd en geduld overwinnt alles" (Time and patience overcome everything). Although Old Jan could talk very little but his native Hollandish, he was an inspiration to the whole mill.

May light perpetual shine upon him!

SHIRT TALE

According to a New York report published in the "Signposts" section of Salesweek early in August, woven and knitted sport shirts are selling like the proverbial hot-cakes; so far this year sales have reached the nifty figure of what would amount to annual total of 770 million dollars; it is estimated by the same writer that by 1965 this figure will be 900 million dollars, which is a lot of shirts for a lot of people. One concern alone is said to have sold 15 million shirts this year. Naturally, this does not include those crude characters we see occasionally mowing the lawn stripped to the waist.

AGRICULTURAL

If you have had the trouble we have had in growing tomatoes the last year or two, you may like to know about what a Rutgers University vegetable specialist has to suggest for our guidance during the coming spring of 1961.

This year a certain quantity of fusarium-wilt-resistant plants were put on the market but the supply was soon exhausted. Although we have a far-from-green thumb, time was when we grew some specimens of the "beefsteak" variety that were what Elmer would classify as "whoppers". It might be a slight exaggeration to say that we had to cut them in two in order to get them into the house, but they certainly were something over "jumbo" size; but such happenings are a thing of the dim and distant past; not because our right hand has lost its cunning, for although we are not as diligent as we one time were, we have a satisfactory alibi, inasmuch as our friends and neighbors seem to be having the same experience, even those with the green thumbs on both hands.

Now the truth is out. The fusaria are to blame; not the neglect we have meted out to those poor growing entities, not entirely that is.

W Bradford Johnson, the Rutgers man, has told it to the seedsmen and the seedsmen have told it to the greenhouse men who grow the little plants that you and we plant. So relief is apparently in full sail and coming toward us in time for spring 1961; take hope, fellow weed-growers and pullers, next year we shall be growing that good fruit of fine appearance, size and flavor, that will stand photographing -- and bragging about.

Ah! There's a fascination attached to gardening and farming in general, planting seeds and seeing things grow, going to bed with the chickens and getting up with the birds, except in the spring when some go to bed with the strawberries and get up with the hives.--QEF

News of the Trade

US Tariff Commission Reports Large Increase in Production of Synthetic Organic Chemicals in 1959

The U S Tariff Commission has released its forty-third annual report on production and sales of synthetic organic chemicals in the United States. The report includes data on those individual chemicals for which the volume of production or sales in 1959 exceeded 1,000 pounds or for which the value of sales exceeded $1,000. Earlier this year the Commission issued preliminary reports on production and sales in 1959 of the 14 individual groups of synthetic organic chemicals covered in the final report.

According to the report, production in 1959 of synthetic organic chemicals and their raw materials was 89,874 million pounds, or 12.3 percent more than the 80,007 million pounds (revised figure) produced in 1958. Sales of synthetic organic chemicals and their raw materials in 1959 amounted to 52,973 million pounds, valued at $7,267 million, compared with 43,309 million pounds, valued at $5,953 million (revised figures) in 1958. As these totals include data for chemical raw materials, as well as semifinished and finished products, they necessarily involve considerable duplication.

Statistics included in the final report were compiled from data supplied by 653 primary manufacturers. The report covers more than 6,000 individual chemicals and chemical products, and gives separate production and sales statistics for many of them. Also included in the report is a list of manufacturers of each item for which production and sales were reported, and statistics on U S general imports in 1959 of products entered under paragraphs 27 and 28 of the Tariff Act of 1930, which cover coal-tar intermediates, dyes, medicinals, and other finished coal-tar products. The report also presents statistics on the number of technical workers engaged in research in the synthetic organic chemical industry, their average salaries, and the amounts expended for such research by the reporting companies.

The report comprises three major sections—those on chemical raw materials, cyclic intermediates, and finished synthetic organic chemical products. The first section includes statistics on tar, tar crudes, and crude chemicals derived from petroleum and natural gas. Total production of coal tar, water-gas tar, and oil-gas tar in 1959 amounted to 669 million gallons—4.1 percent less than the 698 million gallons reported for 1958. Production in 1959 of all tar crudes amounted to 8,447 million pounds, compared with 8,879 million pounds (revised figure) in 1958. The most important individual products in this group are benzene, toluene, naphthalene, and creosote oil. The output of crude products from petroleum and natural gas in 1959 was 24,422 million pounds, compared with 20,903 million pounds in 1958. Included in this group are benzene, toluene, xylene, and other cyclic products, and aliphatic hydrocarbons such as ethylene, propane, and 1,3-butadiene, the latter being one of the basic raw materials for the manufacture of S-type synthetic rubbers.

Production of cyclic intermediates, which is covered in the second section of the report, amounted to 8,459 million pounds in 1959, or 27.3 percent more than the 6,643 million pounds reported for 1958. As in earlier years, more than 60 percent of the output of cyclic intermediates in 1959 was used by the original manufacturers to produce more advanced products. The remainder was sold to other companies for further processing.

The third section of the report deals with finished synthetic organic chemicals and chemical products. The total output of such products amounted to 41,855 million pounds in 1959, compared with 36,603 million pounds in 1958. Of this total, cyclic finished products accounted for 7,913 million pounds and acyclic products, for 33,943 million pounds. All the 11 groups of finished synthetic organic products were produced in greater quantities in 1959 than in 1958. The groups for which the greatest increase were shown were plastics and resin materials (29.8 percent), plasticizers (28.9 percent), elastomers (28.3 percent), rubber-processing chemicals (24.4 percent), dyes (21.1 percent), and toners and lakes (20.6 percent).

Copies of the Commission's report, which is entitled *Synthetic Organic Chemicals, U S Production and Sales, 1959* (Report No. 206, Second Series), may be purchased from the Superintendent of Documents, U S Government Printing Office, Washington 25, DC, at $1.00 per copy.

VDI Findings Confirmed

Findings presented by The Vat Dye Institute this year regarding market potential for colored bed sheets and pillow cases have been confirmed in actual dollar volume during August white sales in ten cities across the country, according to James A Naylor, president of The Vat Dye Institute. In a personal interview poll conducted in department and specialty stores, domestic buyers, almost without exception, reported a definite rise in sales of colored sheets during 1960 August white sales over the same period in 1959, even though total sales rose only slightly.

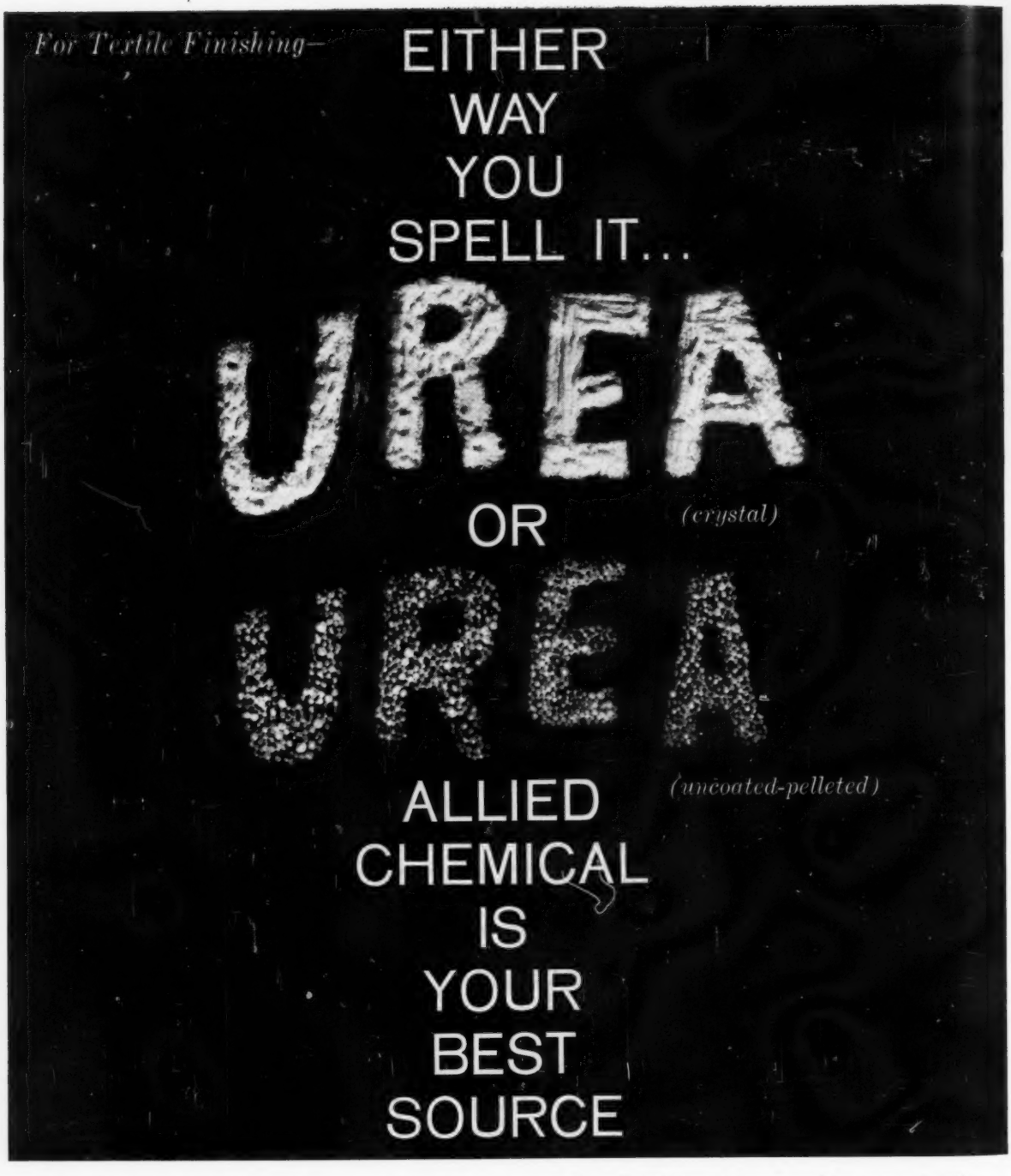
The findings apparently prove further facts brought out in the direct consumer nationwide survey conducted by The Vat Dye Institute that colored sheet owners buy more sheets and pillow cases than do buyers of white sheets.

The VDI survey consumer breakdown showed that colored sheet owners number only 36% of American homemakers. However, their average inventory was reported to be 32 sheets and pillow cases, while the remaining percentage accounts for only 27 sheets and cases in total average inventory.

In market areas, domestic buyers who reported a rise in August 1960 white sales over 1959 August white sales noted not only acceptance, but growing preference for solid colors and fancies among summer buyers. Slight variations in this follow-up report were seen among two or three stores polled within each city, but a definite national pattern towards colored linens could be found in larger cities.

Generally speaking, Mr Naylor concluded, all store buyers agreed that consumer reluctance to color based upon fading is vanishing. Apparently the customer assumes that quality merchandise will be colorfast and is more willing to pay premium price for fashion solids, prints and stripes.

Success of prints and other fancies will continue to rise, Mr Naylor feels, with solid colors becoming linen wardrobe basics. Pink, even though considered "feminine" in the VDI survey, still ranks number one in national sales. Lilac shade popularity buyers attribute to short term and expect it to be replaced by yellows and greens within the next few years.



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2819

DEERING, MILLIKEN OFFICIALS HOST NCTE—Front row, l to r: Russell B Newton, president, Deering Milliken Research Corp; Malcolm Campbell, School of Textiles, North Carolina State College; Ray Flege, Texas Technological College, NCTE president; James Taylor, A French Textile School, Georgia Institute of Technology, NCTE vice president; Stanley Backer, Massachusetts Institute of Technology, NCTE secretary; Kenneth M Lowry, general mgr, Deering Milliken Service Corp

Back row, l to r: K J Scarlett, director, Placement Dept, Deering Milliken Service Corp; Bertrand W Hayward, Philadelphia Textile Institute; William Harris, Institute of Textile Technology; John F Dillon, Textile Research Institute; Cleveland L Adams, Auburn University; L K Fitzgerald, Deering Milliken Service Corp; Martin J Lydon, Lowell Technological Institute; Gaston Gage, Clemson College; L H Hance, Institute of Textile Technology, NCTE treasurer; Harry Riemer, Henry Bach Associates, Inc, honorary member, NCTE; Hugh M Brown, consultant; Dmitry Gagarine, vice president, Deering Milliken Research Corp; Bruce W Stroup, assistant director, Placement Dept, Deering Milliken Service Corp.

Textile Educators Guests of Deering Milliken

Members of the National Council for Textile Education recently heard Roger Milliken project his thoughts on future developments in the U S textile industry and discussed with him the rigid educational programs that textile colleges must provide.

The educators were among the first to be shown the blueprints of the completely automated cotton spinning mill soon to be constructed by Deering Milliken in Spartanburg, SC.

As guests of Deering Milliken, the Council held its annual meeting at the Company's Peach Queen Guest House in Spartanburg, for three days, October 23-25.

Results of the meeting were reviewed by Malcolm E Campbell, dean of the School of Textiles at North Carolina State College and chairman of the Council's publicity committee.

Representatives of the country's nine textile colleges offering bachelor's degrees in textiles and three others engaged in graduate textile education and research, who comprise the Council's membership, were invited to inspect the new research and service facilities of Deering Milliken. Russell Newton, president of the D M Research Corporation, Kenneth Lowry, general manager of the D M Service Corporation, and members of both staffs, provided a full afternoon's tour, and a program describing the company's organization, objectives, techniques, and college-recruiting and training activities. At a dinner meeting, some thirty plant managers and executives of Deering Milliken described their responsibilities, and engaged in an informal discussion with the college representatives, pinpointing some of the aspects of texile education that need stressing.

To meet future competition, both foreign and domestic, Roger Milliken underlined the need for highly trained, highly imaginative texile graduates in increasing numbers. The textile plants of the future will be much more complex and automated than anything heretofore dreamed of, he said, so that emphasis on technological and engineering skills will far outweigh the "ability to manage and get along with people," so important in the past.

Mr Milliken also outlined a new cooperative program in which the several textile colleges will each be invited to send a textile professor and group of handpicked students to work in his company's plants during the

In the Council's executive sessions, discussions centered around the new programs now in effect in many of the institutions represented, in which basic technology and science are being stressed, as opposed to the traditional "how-to-do-it" curricula and courses offered in the past.

Textile college enrollments are increasing significantly, and upwards of 1900 full-time students are now studying at the dozen institutions that the Council's members represent. It was felt that this marked trend is the result of several factors, including better conditions in the textile industry, higher starting salaries for graduates, increased numbers of scholarships provided by industry, intensive recruiting programs in several of the schools, and improved educational programs to meet the current and future needs of the industry.

Preliminary plans were laid for a four-day seminar of textile teachers to be held in June, 1961 at the Philadelphia Textile Institute.

Funds in the Council's treasury were increased by an additional donation by Harry Reimer.

Site of the 1961 meeting of NCTE was not selected, but invitations from several industrial firms in the North and South are being considered. Officers of the Council are: Ray Flege, Texas Technological College, president; James Taylor, Georgia Institute of Technology, vice president; Stanley Backer, Massachusetts Institute of Technology, secretary; and L H Hance, Institute of Textile Technology, treasurer.

Polymer Industries to Handle CMC Warp Size

The appointment of Polymer Industries as a sales agent for CMC Warp Size was announced this month by Hercules Powder Co.

Polymer Industries, with offices in Springdale, Conn, and Greenville, S C (Polymer Southern Division), will act as sales agent for CMC Warp Size to the synthetic fiber, wool, and synthetic fiber-wool blends segments of the textile industry. Polymer Industries' experience in this part of the textile industry will be available to assist textile mills in using Hercules CMC Warp Size.

Hercules CMC Warp Size reportedly is growing in importance in the textile industry because of its low bacterial oxygen demand (BOD) and other production advantages.

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Theory on Kingsport Explosion Advanced

Tennessee Eastman Co has announced that it is believed that the explosion which occurred at its Kingsport plant on October 4 was the detonation of a mixture of nitrobenzene, nitric acid and water. It has been concluded that a substantial concentration of water was present at the time of the explosion. The violence of the explosion indicated that the mixture was detonated with a speed and power comparable to TNT.

This experience warns of the great potential dangers associated with a mixture of nitrobenzene and nitric acid even with substantial quantities of water present.

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Cyanamid's Petrochemicals Dept HQ Moves to NJ

Effective December 5, headquarters offices of the Petrochemicals Department of American Cyanamid Co will be located at Bound Brook, NJ.

The move is said to be the first of several planned for the near future leading to the establishment of Division headquarters at the Bound Brook location about mid-1961.

The Petrochemicals Department markets Cyanocel chemically modified cellulose, pimelic acid, acrylamide and acrylonitrile, the latter manufactured at the company's Fortier, La, (petrochemicals) plant.

Petrochemicals personnel and functions affected by the relocation are T D Smith, department manager; L G Tompkins, technical manager; E C Hallberg, technical representative; J M McNamee, sales manager; and G E Brendel, supervisor of order processing.

Stowe-Woodward Opens New Plant in Wisconsin

The Wisconsin Division of Stowe-Woodward, Inc has been enlarged with the opening of a new and modern 32,300-square-foot manufacturing plant. Located in Neenah, Wis, on Route 41, it will be the third Stowe-Woodward plant to offer suction press roll covering service to its customers. The firm also maintains divisions and manufacturing plants in Newton Upper Falls, Mass, and Griffin, Ga. The Wisconsin Division was established in 1954. Customers in the Fox River Valley and the Mid-Western states will be serviced by this Division.

The new plant incorporates the latest techniques and design for the processing of rubber-covered rolls. The interior of the plant was specifically designed to meet the unusual production flow and work area requirements inherent in the rubber-roll-manufacturing industry. The installation of a two-wheel grinder capable of handling rolls 63″ in diameter and 380″ in face length is designed to provide flexibility necessary to handle present and future needs of its customers efficiently.

Although the plant is in full operation now, the official dedication is not scheduled until next spring. It will coincide with the 75th Anniversary year of the firm.

S J Budowle is the plant manager. E R Schabloski is sales office manager. Sales engineers of the Wisconsin Division are: J J Dickson, C K Pfrangle and C J Ferrara.

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PTI Adopts New 5-Year Development Program

The board of trustees and the alumni board of government of the Philadelphia Textile Institute have adopted a new five-year development program with a goal of $4,051,775.

The College recently completed a ten-year development program which enabled it to develop a $5,000,000 campus which includes a laboratory and classroom building, a library, a 75-room men's dormitory and a student union building.

The new program is specifically aimed at faculty salary improvement, pension endowment fund development, accelerated amortization of the debt service on the dormitory and student union building, a 50-room women's dormitory, expanded research facilities and equipment, equipment for laboratories in support of the curriculum diversification and replacement and modernization of present laboratory equipment.

25% Increase in LTIRF Contracts

A 25% volume increase in contracts for the Lowell Technological Institute Research Foundation for the fiscal year ending June 30 was reported by Dorrance H Goodwin, executive director, at the annual meeting of the board of directors Oct 21 at LTI. Dollar-value of the contracts received amounted to $383,000 compared with $320,000 in the previous year.

There was a great increase in the work done in electronics and physics as well as in chemistry, leather, paper, plastics, and textiles.

In his annual report to the board, Mr Goodwin pointed out that approximately 50% of the LTI faculty and a greater number of students than ever before engaged in research projects last year at the Foundation, which increased its permanent staff by 19. A significant development was the establishment of a leather division within the organizational framework which includes divisions of research and development, testing, and electronics and physics.

Two staff members attended the recent classified meeting of 15 military and research leaders at the Pentagon in Washington, at which LTI was the only educational institution in the country represented.

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Glyco Names New West Coast Representative

Glyco Chemicals, a division of Chas L Huisking & Co, Inc, has appointed Quad Chemical Corp, a newly formed company located in Los Angeles, as its West Coast representative, effective December 1st.

The new representative, headquartered at 2472 Hunter Street, will serve as distributor for all Glyco products in California, Oregon, Washington, and Arizona.

Quad Chemical has been organized to provide a specialty distributor service. Its sales program is based on offering greater knowledge and technical know-how for the purposely small number of concerns it represents. It plans to work closely wih the technical staffs of customers and prospects.

The company is headed by Harry M Fieger, president, who was formerly sales manager of new chemical products for L H Butcher Company of Los Angeles. Vice president and technical director is Harlan Bishop, a veteran chemist. Stanley Stuteville, former chemical division sales coordinator for L H Butcher, is secretary and treasurer.

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NID Advisory Committee Discusses Claims Guide, Belts, Chafing Organdy

A progress report on National Institute of Drycleaning's proposed claims adjustment guide, the poor performance of contour-type dress belts in drycleaning, and the growing number of complaints of chafe marks or chalking on silk organdy fabrics were among subjects which received special attention at recent meetings of the Institute's Textile Analysis Advisory Committee. The Committee met with members of the technical staff at NID Headquarters in Silver Spring, Md, October 27 and 28.

The Committee welcomed as a new member Harley Y Jennings, professor of textile research at North Carolina State College and former director of research of Dan River Mills. He succeeds Charles A Seibert, formerly of E I duPont de Nemours & Co, Inc, who has served on the Committee since its inception in 1957.

The TAAC consists of four independent consultants who meet twice a year to deliberate with Institute personnel on questions concerning the operation of NID's Textile Analysis Department, which currently handles at the rate of 30,000 damage problems annually in its two laboratories in Silver Spring and Glendale, Calif. Other members of the Committee are: Charles W Dorn, textile consultant; Dorothy C Matthai, formerly merchandise manager, Baltimore Better Business Bureau; and Mary C Whitlock, chairman of Textile and Clothing Department, Univ of Rhode Island.

The Committee approved with modifications a draft of NID's proposed National Claims Adjustment Guide for Consumer Textile Products recommending that it be presented in tentative form at the 1961 NID Convention in Philadelphia February 2-5. It was further recommended that NID offer this guide to other consumer-related organizations for their study looking toward its establishment as a national standard. With this as a possibility NID has conferred in the development of the guide with insurance adjustment experts, and representatives of the Association of Better Business Bureaus, National Retail Merchants Association, National Association of Retail Clothiers and Furnishers and the American Home Economics Association.

The guide is designed to simplify determination of a fair monetary value on damaged goods subject to adjustment. It does not establish liability for claims losses. It includes a "life expectancy" table for all types of apparel and household goods and a "depreciation scale" for calculation of a suggested adjustment. The Committee estimates that ultimate acceptance of the guide will effect savings of several millions of dollars annually to drycleaners in curbing unreasonable damage claims, and it should prove of value in terms of customer good-will. It may prove even more important to retailers in the handling of claims losses. The use of the guide would be voluntary.

The guide takes into account such factors as condition of the article and the effect of time on fashion depreciation. It specifies that damage to buttons, belts, and other detachable accessories shall not affect the value of the entire garment since these are replaceable with a reasonably satisfactory substitute. The Committee has also recommended limiting the drycleaners' liability to only the items received for cleaning. This is intended to cover situations arising from damage to one item and its effect on complementary items not received, such as the cleaning of only the trousers of a suit or one drapery of a set of several draperies.

The Committee was especially concerned about a reported increase in complaints from drycleaners about contour-type dress belts and certain styles of straight belts which become damaged in cleaning. The two main problems as reported in NID's current Fabrics Fashion bulletin #75 are: 1) adhesives used in fabrication which are softened by drycleaning solvents and stain through the outer fabric of the belt and 2) backing materials which become stiff and distorted in cleaning or pressing. Albert E Johnson, NID's director of trade relations, will confer with officials of the belt industry on how to correct the problem.

The Committee was unanimously of the opinion that belt cleanability should be defined in terms of full cycle machine handling the same as the dress. Hand cleaning methods, while admittedly widely practiced today as a safety measure, are considered unsatisfactory for the proper cleaning of an item that generally becomes heavily soiled. It was noted that considerable progress has been made in the manufacture of fully cleanable straight belts which utilize the special backing materials available for matching type self belts. It is felt that adhesives technology has now progressed so that solvent-fast binders are available as substitutes for the troublesome rubber-based cements customarily used.

Chafing of silk organdy, sometimes described as chalk-line marking, which occurs on these fabrics during wear and in drycleaning, was reported by NID's chief analyst, W Clay Hardin, as a frequent cause of complaint. Forty-two such problems were handled in the NID lab during August and September, the largest number to date. The condition is said to be the result of extraneous material on the yarn. The Committee recommended that the Institute investigate the behavior of a number of organdy finishes, suggesting the use of the standard Crockmeter test of the American Association of Textile Chemists and Colorists as a means of establishing a recommended level of resistance to this condition. It was demonstrated to the Committee that 20 strokes of this instrument on a folded edge of organdy in damaged dresses was sufficient to reproduce the damage.

Mr Hardin reported that fluorescent dye complaints were continuing at the fairly high average of 25 per month with a high of 42 in one month last Spring. These involve mainly wool, silk, and some synthetics such as nylon. It is suggested that American Standard L22 requirements for lightfastness according to end-use be used as criteria for determining the suitability of these compounds as fabric finishes.

The Committee feels NID should make greater use of established test methods and performance standards to improve communications with textile sources on specific problems. The proposal will be studied to determine how these tests can be most effectively utilized.

The Committee will hold its next meeting April 27 and 28, 1961.

•

Solvay Expands Chlorinated Methane Facilities

Expansion of chlorinated methane facilities at the Moundsville, W Va, plant of Solvay Process Div, Allied Chemical Corp, was announced October 24.

According to W H Brumfield, Solvay's president, chlorinated methanes capacity will be increased by approximately 40 percent. Mr Brumfield stated that the additional production is needed to meet rising demands for chloromethanes in a number of industrial applications.

Solvay's chlorinated methane installation went into operation in 1954. Other products manufactured by the division at Moundsville are chlorine, caustic soda and vinyl chloride.

Celanese Announces Changes in Intermediates Distribution

Celanese Chemical Company recently announced changes in future distribution throughout the southeastern area of its acetic acid, formaledhyde, sodium acetate and other chemical intermediates. Effective January 1, these products no longer will be distributed through F H Ross & Co Charlotte, NC.

After that date, the intermediates will be marketed directly by Celanese from its terminal facilities at Rock Hill, SC, and through established distributors, including: Ivey Chemical Co, Greenville, SC; General Chemical Co, Charlotte; Axton-Cross Co, Greensboro, NC, and Southern States Chemical Co, Atlanta.

The Rock Hill terminal, which has been a storage-distribution base for Celanese acetic acid tank truck sales in the south for nearly 11 years, was expanded three years ago to include many other chemical intermediates used by the textile and related industries.

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Coleman Instruments Acquires Delmar Scientific Labs

Coleman Instruments, Inc, Maywood, Ill, has completed the purchase of Delmar Scientific Laboratories of Chicago. Coleman Instruments, Inc, manufactures scientific instruments for chemical analysis. Delmar, fabricator of precision glassware for scientific apparatus, will be a subsidiary of the Coleman corporation.

Delmar facilities, presently located at 4701 W Grand Ave in Chicago, will be moved to new expanded quarters being prepared across from the Coleman research and engineering building in Maywood. Founders of Delmar will continue as key officers of the subsidiary: Sam Gutilla, vice president in charge of sales; Fred Heuschkel, vice president in charge of operations.

Delmar is expected to be in full operation in its new quarters by 1 December. It is anticipated that a portion of Delmar's production will be utilized by Coleman Instruments, Inc in the manufacture of its laboratory instrumentation.

•

Silk Featured in New Free Film

A new 16mm-sound motion picture, "Naturally, Silk" (15 minutes, color), is now being offered free to adult groups, high school and college classes.

The film unfolds a colorful story of silk from ancient times to the present with emphasis on the fabric rather than fashion. It follows the production of raw silk from cultivation of the humble silk worm through various steps of development. The film stresses the qualities of silk provided by nature as well as the fiber's strength and versatility.

Shown are the reeling and baling of raw silk, dyeing and stretching of the yarn, and manufacture of various types of the material on looms. There are beautiful scenes taken on location in Bermuda depicting the place of silk today in wardrobes of both men and women.

The movie was produced for the International Silk Association (USA), Inc, by Colorcraft Studios of New York, and is being distributed by Modern Talking Picture Service. Prints may be borrowed from any of Modern's 30 film libraries, located in principal cities throughout the country. Requests sent to Modern's headquarters at 3 East 54th Street, New York 22, NY, will be forwarded immediately to the proper film library.

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Fiber Society Establishes Annual Award

The Fiber Society has established an annual award for outstanding achievement by a young fiber scientist.

At the group's fall meeting held in Washington last month, members voted to create "The Fiber Society Award for Distinguished Achievement in Basic or Applied Fiber Science."

An engraved scroll and $500 will be given by the Society to the scientist for achievement completed before his thirty-fifth birthday.

The Society, in deciding to establish the award as a stimulus for younger scientists, said that several awards already exist for lifetime contribution to fiber science.

Stanley Backer, associate professor of mechanical engineering, Massachusetts Institute of Technology, was elected Society president at the group's annual business meeting. He succeeds Ernest R Kaswell, Fabric Research Laboratories.

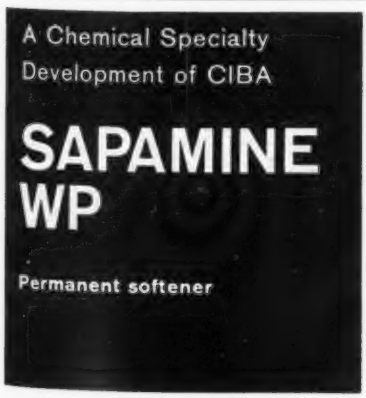
Elected vice president was John Dillon, president, Textile Research Institute. Re-elected to the office of secretary was Julian Jacobs, former editor of *Textile Research Journal*, and re-elected to treasurer was Hugh Brown, research consultant, Clemson, SC.

New members of the governing council are: Alfred Burgeni, Personal Products Corp, and Richard Steele, Rohm and Haas Co.

•

Borden's Expanding Canadian Facilities

Construction by The Borden Chemical Company (Canada) Ltd of new manufacturing facilities for the production of polyvinyl acetate emulsions, polystyrene and acrylic emulsions, and liquid urea resins, has been announced. The expansion program includes a recently completed warehouse building, located adjacent to existing manufacturing facilities at West Hill, Ont, which has doubled the company's storage area.



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CIBA WHERE RESEARCH IS THE TRADITION

• NAMES IN THE NEWS •

The following slate of candidates for 1961 officers and members of the board of governors of the Synthetic Organic Chemical Manufacturers Association of the United States has been submitted:

President — Carl A Gerstacker, chairman of the board, Dow Chemical Co

1st Vice President—Chester M Brown, president, Allied Chemical Corp

2nd Vice President—Arthur P Kroeger, asst gen mgr, Organic Chemicals Div, Monsanto Chemical Co

Treasurer—Robert L Bateman, mgr, marketing services, Union Carbide Chemicals Co, Union Carbide Corp

Board Members (Class of 1963)—Louis F Loutrel Jr, vice president sales, Maumee Chemical Co; *Carl S Oldbach,* asst gen mgr, Organic Chemicals Dept, E I duPont de Nemours & Co, Inc

Honorary Board Members (Class of 1961)—Elvin H Killheffer; August Merz, American Cyanamid Co.

These candidates will be voted on by the general membership at the Annual Business Meeting of the Association on Dec 8.

C Kenneth Egeler, Eastern manager of the Pigment, Color and Chemical Division, The Sherwin-Williams Co, and *Thomas C Keeling Jr,* vice president and general manager of the Chemicals & Dyestuffs Division, Koppers Co, Inc, will continue as members of the board of governors (Class of 1961). *Robert M Aude,* president, Heyden Chemical Div, Heyden Newport Chemical Corp, will continue as member of the board of governors (Class of 1962).

Stoddard

Lawrence D Stoddard has been named sales representative for the East Central District of the Silicone Products Department of the General Electric Company, Waterford, NY. His office location will be 1503 Brookpark Rd, Cleveland.

He has been with the Silicone Products Department since February of this year.

•

Paul A Merriam, a sales engineer representing Riggs & Lombard, Inc, Lowell, Mass in the Providence area, retired this past summer after having been connected with the Lowell firm for twenty-five years.

Mr Merriam, who resides in Pomfret, Conn, represented Riggs & Lombard in Rhode Island, Connecticut, and southern Massachusetts working out of his own office in Providence.

Before his affiliation with Riggs & Lombard, Mr Merriam was chief engineer for the U S Finishing Company.

•

George W Murray has recently joined the technical sales staff of Lenox Chemical Co, Providence, RI, to serve the northern New England area.

Prior to assuming his present position, Mr Murray was sales representative for Murray-Young Co.

Michael J Gluck has been appointed vice president and general manager of Heyden Newport International Division.

A chemical engineer, Mr Gluck has had extensive experience in international operations as director of overseas operations for the Corporation's Nuodex Products Division since 1956.

•

Appointments of *Norman F Heydinger* and *Robert L Morgan* to the newly created positions of manager—marketing services and manager—woven textile marketing, respectively, in the firm's Fiber Glass Division have been announced by Pittsburgh Plate Glass Company.

Mr Heydinger formerly served as a marketing analyst in the Merchandising Division's marketing research department since joining the Company in 1959.

Mr Morgan, who joined Pittsburgh Plate recently, had formerly been associated with the production and development of fiber glass decorative fabrics with Burlington Industries, Inc.

•

Sidney Braverman has been appointed supervisor, Pigment Applications Laboratory, Pigment Technical Service Department, Sandoz, Inc.

Mr Braverman has been associated with the paint industry in the New York area for approximately 20 years.

•

Food Machinery and Chemical Corp is now in regular production of chlorinated dry bleaches and has named *Barry L Davis* product manager.

Mr Davis assumes his new position from FMC's Los Angeles, Calif, sales district where he was a sales representative since 1957.

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CIBA WHERE RESEARCH IS THE TRADITION

Charles Allen Thomas, chairman of the board of directors of Monsanto Chemical Co, St Louis, Mo was cited for his contributions in the field of chemistry, to higher education and the nation on October 9 by Lehigh University.

He was awarded the honorary degree of doctor of laws durling the 82nd annual Founder's Day exercises held in Packer Memorial Church.

During the exercises 70 seniors received baccalaureate degrees. *Lawrence H Gipson,* noted historian and author, was the principal speaker.

●

The Chemical Division of International Latex Corp has announced the appointment of *Kenneth H Barratt* to the post of regional sales manager for the northeastern United States area. In his new capacity Mr Barratt will be servicing consumers with nitrile, butadiene/styrene, high styrene and acrylic latices—all Tylac latices produced by International Latex Corp's polymer plant at Dover, Del.

With the opening of a regional office in the Boston area, International Latex is expected to improve service to its present customers and concentrate on establishing new accounts in such fields as textiles and nonwovens.

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Louis S Goldberg, formerly manager of marketing and advertising for Onyx Chemical Corp, has joined Buell Engineering Co, New York, NY, as director of marketing.

●

Walter A Gay has joined the Dewey and Almy Chemical Div, W R Grace & Co, Cambridge, Mass, as a research chemist in the organic chemicals laboratory.

Gay will conduct polymer research in support of Dewey and Almy's line of latices and emulsions.

Cohen

Henninger

Fineberg

Appointment of three vice presidents for Glyco Chemicals (a division of Chas L Huisking & Co Inc) has been announced. Elevated are: *Samuel Cohen,* who becomes vice president in charge of sales; *Arthur H Henninger,* named vice president in charge of operations at Williamsport, Pa; and *Herbert Fineberg,* who will be vice president and technical director. The appointments are effective immediately.

Mr Cohen, formerly marketing director of the division, joined Glyco Chemicals in 1945 and has served in numerous laboratory and production capacities since that time. His headquarters will be located in New York.

Mr Henninger started with Glyco 13 years ago as plant superintendent of its former Natrium, W Va, unit. He became superintendent of the Williamsport facilities in 1952 when operations were transferred there, and moved up to plant manager last year.

Dr Fineberg went from Naugatuck Chemical to Glyco's Natrium plant in 1947 as chief chemist. He was subsequently named director of research at that location and continued in that position at Williamsport. The latter will continue to be his headquarters.

●

The appointment of *Gail Ann Wildrick* to the Corporate Research and Development Department of the Colgate-Palmolive Co has been announced.

Mrs Wildrick joined the Basic Chemical Research Section at the Company's Research Laboratories in Jersey City. The section handles the fundamental studies of the chemical constituents of Colgate-Palmolive products. It also investigates new compounds of potential interest.

●

Henry A Johnson has joined the Dewey and Almy Chemical Division, W R Grace & Co, Cambridge, Mass, as development chemist in the textile printing blanket laboratory.

Johnson was formerly with the B F Goodrich Footwear and Flooring Company, Watertown, Mass.

●

J W McCarty of the A French Textile School has returned to Georgia Tech after a year's leave of absence.

Professor McCarty spent the year in Korea under the auspices of the University of Minnesota, aiding in the rehabilitation of the laboratories and the upgrading of the curricula of the Engineering College of Seoul National University.

Professor McCarty spent most of his time in Korea designing and laying out new textile laboratories and ordering and installing American textile machinery. Slightly over a quarter million dollars worth of equipment was purchased for the Textile School. New curricula for the school which would more nearly approach the American ideas of engineering education were also developed and recommended to the Engineering College for adoption.

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CIBA WHERE RESEARCH IS THE TRADITION

Vinyl Spray "Prints" Cloth in New Process

A new technique for applying patterns and textures to a wide range of fabrics by production-line methods—but without the expense of costly engraving rolls or heavy fabric-printing equipment—was demonstrated last month at North Carolina State College's School of Textiles.

The process, developed by B F Goodrich Chemical Co, Cleveland, O, was demonstrated on production-scale spraying equipment donated to the School of Textiles by Binks Mfg Co, Chicago, Ill.

In the process, liquid vinyl plastic is sprayed on textiles in abstract swirls, random line or spatter designs. On heating in the range of 310-450°F, the vinyl fuses to the fabric in permanent patterns or textures that withstand washing and drycleaning, and can be ironed on the "wrong side." Additional interest can be obtained by sprinkling Metalflake on the pattern before fusion to give a glitter effect. The fabric's hand is said to remain practically unaltered.

Developers of the process state that three-dimensional "printing" of textiles is now possible, and the reaction of the mill people is most enthusiastic.

Lawrence L Shailer, manager of textile chemicals sales development for BFG Chemical, commenting on the new process said, "This decorative spray technique offers a unique opportunity to designers and manufacturers. A great variety of fabrics from wovens to nonwovens to knitted materials, tight or loose construction, may be decorated by this method. Patterns and colors are practically unlimited."

Fabrics prepared in this manner are now being considered for use in automobile interior trim, draperies and curtains, upholstery and slipcover materials, tickings, outerwear fabrics, lingerie, robes, gloves, spreads, linings, lampshade fabrics and wall coverings, Mr Shailer said.

He pointed out that his firm first introduced the decorative spraying technique at its textile chemicals trade show held in New York a year ago. This installation at North Carolina State's School of Textiles is the result of the cooperative efforts of BFG Chemical, Binks Mfg Co and the college to demonstrate the commercial feasibility of the new decorative spraying technique. The equipment provides pilot facilities which will enable individual companies to prepare yardage for test marketing, for evaluating design variations and for studying costs in a practical manner.

DECORATIVE PLASTIC SPRAY fused onto lengths of fabric is examined by three of the men involved in the installation of equipment at North Carolina State's School of Textiles designed to utilize a new "decorative spraying" technique. From left, they are George Knetl, assistant chief engineer for Binks Mfg Co, Chicago; Prof Kenneth S Campbell of The School of Textiles; and Lawrence L Shailer, manager of textile chemicals sales development for B F Goodrich Chemical Co, the developer of the new technique.

In discussing BFG Chemical's development of the new technique, Mr Shailer indicated that his firm supplies only the raw materials used in the process. He pointed out that the plastisols (vinyl plastic in the form of a liquid dispersion) used in the demonstration were prepared by Flexible Products Co, Marietta, Ga, using Geon vinyl materials supplied by BFG Chemical. Flexible Products has been a leader among the formulators offering plastisols suitable for use with the new technique, he explained.

Veiling involves applying a fine thread of fluid from a spray gun nozzle to the fabric to be "veiled." Patterns of whorls, curves and loops are obtained by the unique construction of the fluid orifice and air nozzle on the spray gun. A "worm" pattern or broken veil is also obtainable.

Spatter involves applying droplets of fluid from the nozzle to the fabric. Interesting patterns of large or small droplets can be varied by a simple adjustment of air and fluid pressures.

Veil-sprayed vinyl dispersions are applied with hand-operated or automatic spray guns equipped with decorator heads. Although the detail made by a single head is an abstract swirl (or spatter), a repetitive, reproducible pattern can be developed by the use of multiple spray heads.

The amount of material used varies with the design and averages 0.5-1 ounce/square yard. Coating speeds reportedly can be as high as 100 yards per minute.

Usually the spray application can be integrated into present operations of printing or finishing without difficulty. In some cases, however, it may be necessary to provide for somewhat higher temperatures than those available with present equipment. Electric or gas-fired radiant infra-red heaters are a useful tool in this situation.

Abstract swirl shown here, spatter designs or random effects are possible with new technique developed by B F Goodrich Chemical Co. The firm, represented here by Howard M Sprock Jr, representative for sales development in textile chemicals, on the left, supplies the raw materials for the plastisols used with the spray equipment. Engineer William B Crawford of Binks Mfg Co is adjusting one of the nozzles of the spray equipment manufactured by his company.

Vinyl or nitrile latex may be used in place of vinyl plastisols in the spraying operation. This may be done when heat-sensitive fibers are being sprayed since latices can be cured at lower temperatures. When latices are used, they are simply dried and then heat cured usually at temperatures below 300°F.

The reputed advantages of vinyl plastisols are their low cost, wide color range, excellent aging properties and washfastness. Plastisols may also provide three-dimensional or raised patterns that are attractive to many designers. Wear resistance is said to be substantially improved where three-dimensional patterns are used.

It has been pointed out that latices also display excellent durability but are more costly and their compounding more complex. In addition, it is difficult to achieve three-dimensional patterns when latices are used.

Typical vinyl plastisol, nitrile latex, and vinyl latex formulations may be obtained from B F Goodrich Chemical Co, 3135 Euclid Ave, Cleveland 15, Ohio.

The equipment at North Carolina State consists of a bank of automatic air-operated spray guns for coating the complete fabric width on a continuous basis; fluid, atomization and control air manifolds; hose; air controls and air-operated fluid pump.

The spray guns are actuated by a manual three-way valve. For ease in changing colors the pump is equipped with an air-operated elevator so that it can be raised from one color container and lowered into another. Provisions are also made to raise and lower the entire bank of guns to add additional versatility in obtaining various spray effects.

The entire spray installation is located at the entrance to a tenter frame. Mounting direct to the frame is not recommended because of the possibility of contaminating the chain with the spray material. Only modification necessary for the installation was a hook-up to the school's compressed air system to provide atomizing and control air for the spray guns, and provisions for a minimum 350°F curing temperature in the frame.

Fabric speeds vary—depending on the type of spray effect desired, but in general, fall in the range of 15 to 20 yards per minute for veiling and up to 85 ypm for spatter.

Cost of a typical installation is under $5000. Textile industry applications of Binks equipment include spraying permanent crease solutions to woolen trousers and the Unifog spray process for the application of finishes to textiles. The principal advantage of the Unifog process over the conventional padding operation is said to be that less moisture is introduced into the fabric resulting in a decrease in drying costs and an increase in production capacity.

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National Fast Yellow GL

An exclusive lemon-yellow acid dye, National Fast Wool Yellow GL, is now being introduced for the textile industry by Allied Chemical's National Aniline Division.

Reportedly an excellent base for bright yellow colors, National Fast Wool Yellow GL is said to be level-dyeing and to offer good light- and wetfastness plus outstanding working properties. It is especially recommended by National for wool and nylon 6 and nylon 6.6, as well as on wool and silk and for cross-dyed wool-Dacron blends.

Produced domestically only by Allied Chemical, National Fast Wool Yellow GL is recommended by the Company for dyeing suitings, dress goods, carpet yarns and wool or felt hats.

For further information, write Department PR 80, Allied Chemical Corp, National Aniline Division, 40 Rector Street, New York 6, NY.

Procinyl Rubine BS

A valuable first addition to the Procinyl range of reactive disperse dyes introduced last year has been announced by Arnold, Hoffman & Co, Inc, a subsidary of Imperial Chemical Industries Ltd.

Procinyl Rubine BS, as the new dye is named, is said to extend usefully the range of shades obtainable and in particular makes possible the production of deep rubine shades, hitherto not feasible with Procinyl dyes.

Procinyl Rubine BS is primarily intended for application to nylon and other fibers of the polyamide class, although it is also of interest for synthetic fibers of the unmodified polyacrylonitrile type. Procinyl Rubine BS on nylon combines the advantages of a disperse-type dye with the extremely good wetfastness that results from chemical combination of the Procinyl dye with the fiber, it is claimed. The method of application to polyamide fibers is the same as for the earlier Procinyl dyes, that is, exhaustion of the dye from an acid medium, followed by fixation under alkaline conditions. Dyeing is carried out in conventional equipment. It is stated that no reaction with the fiber occurs in the case of unmodified polyacrylonitrile fibers, for which the normal technique for applying disperse dyes is employed.

It is claimed that the excellent build-up of Procinyl Rubine BS on nylon and its complete compatibility with the other members of the range make it a suitable basis for browns, maroons, bordeaux and violet shades in addition to the deep rubines obtained in self-shades. Procinyl Rubine BS reportedly shows very good fastness to wet treatments, moderately good fastness to light—but quite adequate for end-uses such as lingerie, hose and half-hose and dress goods—and good fastness to heat treatments such as heat-setting. It is said to be resistant to sublimation.

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